Catalogue

Motor protection and control
Manual motor starters, contactors and overload relays

Power and productivity
for a better world™

Motor rated operational powers and currents

The currents given below concern standard three-phase four-pole cage motors (1500 r.p.m. at 50 Hz 1800 r.p.m. at 60 Hz). These values are given for guidance and may vary according to the motor manufacturer and depending on the number of poles.

IEC	Motor nominal current: standardized values in blue colour (according to IEC 60947-4-1 Annex G)									
Motor power	220 V	230 V	240 V	380 V	400 V	415 V	440 V	500 V	660 V	690 V
kW	A	A	A	A	A	A	A	A	A	A
0.06	0.37	0.35	0.34	0.21	0.2	0.19	0.18	0.16	0.13	0.12
0.09	0.54	0.52	0.50	0.32	0.3	0.29	0.26	0.24	0.18	0.17
0.12	0.73	0.7	0.67	0.46	0.44	0.42	0.39	0.32	0.24	0.23
0.18	1	1	1	0.63	0.6	0.58	0.53	0.48	0.37	0.35
0.25	1.6	1.5	1.4	0.9	0.85	0.82	0.74	0.68	0.51	0.49
0.37	2.0	1.9	1.8	1.2	1.1	1.1	1	0.88	0.67	0.64
0.55	2.7	2.6	2.5	1.6	1.5	1.4	1.3	1.2	0.91	0.87
0.75	3.5	3.3	3.2	2.0	1.9	1.8	1.7	1.5	1.15	1.1
1.1	4.9	4.7	4.5	2.8	2.7	2.6	2.4	2.2	1.7	1.6
1.5	6.6	6.3	6	3.8	3.6	3.5	3.2	2.9	2.2	2.1
2.2	8.9	8.5	8.1	5.2	4.9	4.7	4.3	3.9	2.9	2.8
3	11.8	11.3	10.8	6.8	6.5	6.3	5.7	5.2	4	3.8
4	15.7	15	14.4	8.9	8.5	8.2	7.4	6.8	5.1	4.9
5.5	20.9	20	19.2	12.1	11.5	11.1	10.1	9.2	7	6.7
7.5	28.2	27	25.9	16.3	15.5	14.9	13.6	12.4	9.3	8.9
11	39.7	38	36.4	23.2	22	21.2	19.3	17.6	13.4	12.8
15	53.3	51	48.9	30.5	29	28	25.4	23	17.8	17
18.5	63.8	61	58.5	36.8	35	33.7	30.7	28	22	21
22	75.3	72	69	43.2	41	39.5	35.9	33	25.1	24
30	100	96	92	57.9	55	53	48.2	44	33.5	32
37	120	115	110	69	66	64	58	53	40.8	39
45	146	140	134	84	80	77	70	64	49.1	47
55	177	169	162	102	97	93	85	78	59.6	57
75	240	230	220	139	132	127	116	106	81	77
90	291	278	266	168	160	154	140	128	97	93
110	355	340	326	205	195	188	171	156	118	113
132	418	400	383	242	230	222	202	184	140	134
160	509	487	467	295	280	270	245	224	169	162
200	637	609	584	368	350	337	307	280	212	203
250	782	748	717	453	430	414	377	344	261	250
315	983	940	901	568	540	520	473	432	327	313
355	1109	1061	1017	642	610	588	535	488	370	354
400	1255	1200	1150	726	690	665	605	552	418	400
500	1545	1478	1416	895	850	819	745	680	515	493
560	1727	1652	1583	1000	950	916	832	760	576	551
630	1928	1844	1767	1116	1060	1022	929	848	643	615
710	2164	2070	1984	1253	1190	1147	1043	952	721	690
800	2446	2340	2243	1417	1346	1297	1179	1076	815	780
900	2760	2640	2530	1598	1518	1463	1330	1214	920	880
1000	3042	2910	2789	1761	1673	1613	1466	1339	1014	970

UL / CSA	Motor nominal current: standardized values (according to IEC 60947-4-1 Annex G and UL 508)				
Motor power	208 V	220-240 V	380-415 V	440-480 V	550-600 V
hp	A	A	A	A	A
1/2	2.4	2.2	1.3	1.1	0.9
3/4	3.5	3.2	1.8	1.6	1.3
1	4.6	4.2	2.3	2.1	1.7
1-1/2	6.6	6	3.3	3	2.4
2	7.5	6.8	4.3	3.4	2.7
3	10.6	9.6	6.1	4.8	3.9
5	16.7	15.2	9.7	7.6	6.1
7-1/2	24.2	22	14	11	9
10	30.8	28	18	14	11
15	46.2	42	27	21	17
20	59.4	54	34	27	22
25	74.8	68	44	34	27
30	88	80	51	40	32
40	114	104	66	52	41
50	143	130	83	65	52
60	169	154	103	77	62
75	211	192	128	96	77
100	273	248	165	124	99
125	343	312	208	156	125
150	396	360	240	180	144
200	528	480	320	240	192
250	–	604	403	302	242
300	–	722	482	361	289
350	–	828	560	414	336
400	–	954	636	477	382
450	–	1030	–	515	412
500	–	1180	786	590	472

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Motor protection and control
Manual motor starters, contactors and overload relays

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Extensive range of contactors

1

High performance contactors for your applications from 9 to 5000 A

Mini contactors for compact equipments - up to 5.5 kW / 5 hp
Contactors for all industrial applications up to 2050 A and motor starting-up to 560 kW (400 V) / 900 hp (480 V)
Contactors for heavy duty applications - up to 5000 A, 1000 V AC / 1500 V DC

- Complete and harmonized 3 and 4-pole ranges.
- High performance and high quality materials.
- Compact dimensions easy to integrate in all designs.
- AF contactors with electronic coil interface:
  - wide voltage range AC / DC, sag and dips immunity,
  - built-in surge suppressor.
- Complying with the latest international standards.

The right choice for many applications

- Pumps
- HVAC
- Compressors
- Power supply solutions
- Packing machines
- Cranes
- Elevators and escalators
- Moulding machines
  Wood machines
- Robot
- Windmill
- Solar system
- Water heating
- Fuel cells
- Traction

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Motor starting solutions

- Perfect match in starter assembly with a large range of accessories.
- Short-circuit protection, type 1 and 2 coordination.
- Large offer of accessories for direct-on-line, reversing and star-delta starters which allows:
  - time / cost saving,
  - secure connection,
  - aesthetic starters,
  - easy assembly and wiring.

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3-pole contactors

Mini contactors

Contactors for all industrial

IEC	AC-3 Rated operational power	θ ≤ 55 °C*, 400 V	kW	4	5.5	4	5.5	7.5	4	5.5	7.5	11	15	18.5
UL/CSA	3-phase motor rating	480 V	hp	3	5	5	7.5	10	5	7.5	10	15	20	20
AC Control supply			Type	B6	B7	AS09	AS12	AS16	AF09	AF12	AF16	AF26	AF30	AF38
DC Control supply			Type	BC6	BC7	ASL09	ASL12	ASL16	AF09	AF12	AF16	AF26	AF30	AF38
AC / DC Control supply			Type	–	–	–	–	–	AF09	AF12	AF16	AF26	AF30	AF38
IEC	AC-3 Rated operational current	θ ≤ 55 °C*, 400 V	A	9	12	9	12	15.5	9	12	18	26	32	38
	AC-1 Rated operational current	θ ≤ 40 °C, 690 V	A	16	20	22	24	24	25	28	30	45	50	50
UL/CSA	General use rating	600 V	A	12 (300 V)	16	20	20	20	25	28	30	45	50	50
NEMA	NEMA Size			–	–	00	00	0	00	0	–	1	–	–

* θ ≤ 60 °C for AS(L)09 ... AS(L)16 and AF09 ... AF38 contactors

Main accessories

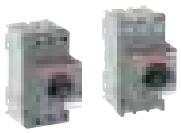
Auxiliary contact blocks	Front mounting	**CAF6**	**CA3-10** (1 x N.O.), **CA3-01** (1 x N.C.)	**CA4-10** (1 x N.O.), **CA4-01** (1 x N.C.)		
	Side mounting	**CA6**		**CAL4-11** (1 x N.O. + 1 x N.C.)		
Timers	Pneumatic (Front mounting)					
	Electronic		**TEF3-ON, TEF3-OFF**			
Interlocking units (1)	Mechanical		**VM3**	**VM4**		
	Mechanical / Electrical			**VEM4**		
Connection sets	For reversing contactors	**BSM6-30**	**BER16C-3**	**BER16-4**	**BER38-4**	
Surge suppressors	Varistor (AC/DC)	**RV-BC6**	**RV5** (24...440 V)			
AF contactors have built-in surge protection	RC type (AC)		**RC5-1** (24...440 V)			
	Transil diode (DC)	**RD7**	**RT5** (12...264 V)			

(1) See available reversing contactors VB6, VB7 and VAS09 ... VAS16

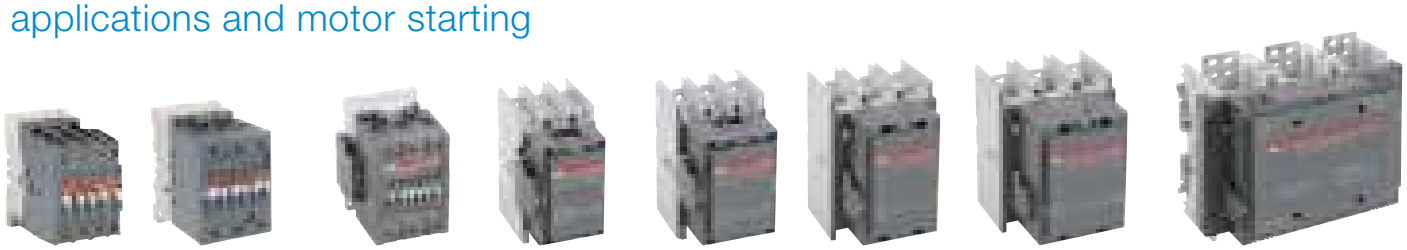
Overload relays

Thermal relays	Class 10 (10A or 20 for TA42DU to TA80DU)	**T16** (0.10...16 A)	**T16** (0.10...16 A)	**TF42** (0.10...38 A)		
Electronic relays	Class 10E, 20E, 30E	**E16DU** (0.10...18.9 A)		**EF19** (0.10...18.9 A)	**EF19** (0.10...18.9 A), **EF45** (9...45 A)	
Accessories for thermal overload relays	Remote tripping coil					
	Remote reset coil					
	Wall/separate mounting kit	**DB16** (T16 only), **DB16E** (E16DU only)		**DB42** (TF42 only)		

Manual motor starters



	Thermal / magnetic protection	Class 10	**MS116** for class 10A (0.16...32 A) Ics up to 50 kA	**MS116** for class 10A (0.16...32 A) Ics up to 50 kA		**MS450**
			MS132 (0.10...32 A) Ics up to 100 kA	**MS132** (0.10...32 A) Ics up to 100 kA		
						MS497
		Class 20				**MS451**
	Magnetic only types			**MO132** (0.10...32 A)		
Accessories	For contactor mounting		**BEA7/132**	**BEA16-3**	**BEA16-4**	**BEA38-4**
	Auxiliary trip units, auxiliary contacts, busbars		**HKF1, HK1, UA1, AA1, PS1, S1, SK1, CK1** (MS132 only)	**HKF1, HK1, UA1, AA1, PS1, S1, SK1, CK1** (MS132, MO132 only)		**HK4,**



	18.5	22	30	37	45	55	75	90	110	140	160	200	250	315	400	—	475	560	—
	30	40	60	60	60	75	100	125	150	200	250	350	400	500	600	—	800	900	—
	A40	A50	A63	A75	A95	A110	A145	A185	A210	A260	A300	AF400	AF460	AF580	AF750	AF1250	AF1350	AF1650	AF2050
	AL40	AE50	AE63	AE75	AF95	AF110	AF145	AF185	AF210	AF260	AF300	AF400	AF460	AF580	AF750	AF1250	AF1350	AF1650	AF2050
	—	AF50	AF63	AF75	AF95	AF110	AF145	AF185	AF210	AF260	AF300	AF400	AF460	AF580	AF750	AF1250	AF1350	AF1650	AF2050
	37	50	65	75	96	110	145	185	210	260	305	400	460	580	750	—	860	1050	—
	60	100	115	125	145	160	250	275	350	400	500	600	700	800	1050	1260	1350	1650	2050
	60	80	90	105	125	140	230	250	300	350	400	550	650	750	900	1210	1350	1650	2100
	—	2	—	3	—	—	4	—	—	5	—	—	6	—	7	—	—	8	—

	CA5-10 (1 x N.O.), **CA5-01** (1 x N.C.)																	
	CAL5-11 (1 x N.O. + 1 x N.C.)				**CAL18-11** (1 x N.O. + 1 x N.C.)													
	TP40DA, TP180DA Direct timing **TP40IA, TP180IA** Inverse timing																	

	VM5-1						**VM300H / VM300V**					**VM750H / VM750V**					**VM1650H**	
	VE5-1	**VE5-2**																
	BER40V	**BEM75-30**		**BEM110-30**			**BEM185-30**		**BEM300-30**			**BEM460-30**		**BEM750-30**				
	RV5 (24...440 V)																	
	RC5-1 (24...440 V)	**RC5-2** (24...440 V)					**RC5-3** (250...440V)											
	RT5 (12...264 V)																	

	TA42DU (18...42 A)	**TA75DU** (18...80 A)		**TA80DU** (29...80 A) **TA110DU** (65...110 A)			**TA200DU** (66...200 A)		**TA450DU/SU** (130...310 A) class 30 for SU									
	E45DU (9...45 A)	**E80DU** (27...80 A)		**E140DU** (50...140 A)			**E200D-U** (60...200 A)		**E320DU** (100...320 A)			**E500DU** (150...500 A)		**E800DU** (250...800 A)			**E1250DU** (375...1250 A)	
									DS25-A									
									DR25-A									
	DB80, DB45E, DB80E			**DB80, DB200, D140E**			**DB200**		**DT450/A**									

Circuit breakers

(40...50 A) Ics up to 50 kA

MS495 (28...100 A) Ics up to 50 kA

(11...100 A) Ics up to 100 kA

(11...50 A) Ics up to 50 kA

MS496 (28...100 A) Ics up to 100 kA

MO450 (16...50 A) Ics up to 50 kA

MO495 (40...100 A) Ics up to 50 kA

MO496 (16...100 A) Ics up to 100 kA

BEA40/450

BEA50/450, BEA75/495

HKS4, UA4, AA4, PS4, S4, SK4

Tmax Circuit breaker and accessories

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4-pole contactors

Mini contactors

IEC	**AC-1 Rated operational current**	θ ≤ 40 °C, 690 V	**A**	**16**	**20**
UL/CSA	**General use rating**	600 V	**A**	**12** (300 V)	**16**
AC Control supply			Type	**B6**	**B7**
DC Control supply			Type	**BC6**	**BC7**
AC / DC Control supply			Type	–	–

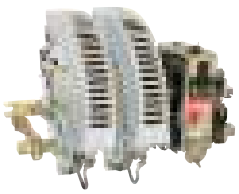
Contactor relays

Mini contactor relays

IEC	**AC-15 Rated operational current**	400 V	**A**	**3**		
UL/CSA	**Pilot duty**			**A 600**		
				2 2	3 1	4 0
AC Control supply			Type	**K6-22Z**	**K6-31Z**	**K6-40E**
DC Control supply			Type	**KC6-22Z**	**KC6-31Z**	**KC6-0E**
AC / DC Control supply			Type	–	–	–

R contactors

DC Circuit switching



DC-1 Rated current up to 5000 A
DC-3/DC-5 Rated current up to 2000 A
1500 V with poles in series

IOR.. 63-..-CC to **IOR.. 5100-..-CC**

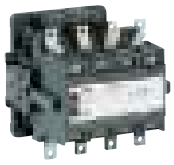
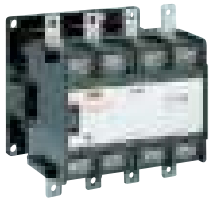
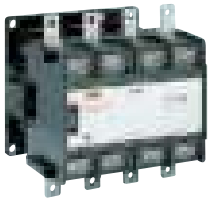
Specific contactors

DC Circuit switching

100 A, 440 V, DC-1
GA75, **GAE75** types

275 to 2050 A, 1000 V, DC-1
GAF185 to **GAF2050** types

Contactors

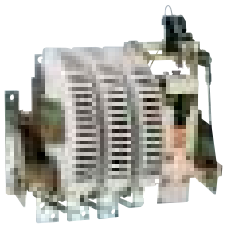




25	30	45	55	70	100	125	200	250	300	350	550	800	1000
25	30	45	55	80	80	105	170	200	250	300	420	540	–
AF09	AF16	AF26	AF38	A45	A50	A75	EK110	EK150	EK175	EK210	EK370	EK550	EK1000
AF09	AF16	AF26	AF38	AE45	AE50	AE75	EK110	EK150	EK175	EK210	EK370	EK550	EK1000
AF09	AF16	AF26	AF38	AF45	AF50	AF75	–	–	–	–	–	–	–

Contactor relays

3			3		
A 600, Q 300			A 600, Q 600		
2 2	3 1	4 0	2 2	3 1	4 0
NS22E	NS31E	NS40E	NF22E	NF31E	NF40E
NSL22E	NSL31E	NSL40E	NF22E	NF31E	NF40E
–	–	–	NF22E	NF31E	NF40E

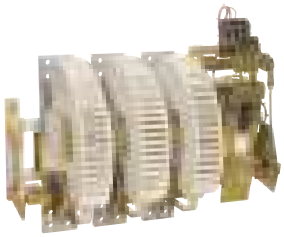
AC Circuit switching



AC-1 Rated current up to 5000 A
AC-3 Rated power up to 1500 kW
(1520 A - 440 V)

IOR.. 63-..-MT to **IOR.. 5100-..-MT**

Special versions



AC/DC Coupling: LOR.. contactors

Slip ring motor control: FOR .. contactors

Field discharge: AM(F)-CC-JORE contactors

AC/DC Switching (N.C./N.O. main poles):
NOR & JOR contactors

Latching contactors for energy saving
and safety requirements: AMA or AME contactors

Capacitor switching

12.5 to 80 kvar

UA16..RA to **UA110..RA** types
UA16 to **UA110** types

Magnetical latching

3 N.O. poles,
22 to 160 kW, 400 V, AC-3

2 N.O. + 2 N.C. poles,
70 to 125 A, AC-1

AM45 to **AM300** types

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ABB's new control and protection devices
Up to 18.5 kW / 20 hp

1

One product family

ABB presents a new generation of first-class specialized components: manual motor starters, contactors, overload relays and softstarters for motor starting solutions up to 18.5 kW / 20 hp

- Harmonized design & colour
- Compact and modular
- Low energy consumption
- Small number of parts
- Minimum need for accessories
- Optimized wiring and configuration
- High ratings and service capability
- Increased application possibilities
- Reliability proven over many years of experience

1SBC101105S0202

Simplicity for your design

Our engineers have taken modularity and uniformity to the next level in terms of flexibility and practicality for your applications. We offer you flexibility, increased application possibilities, exchangeability and reduced panel size.

Safety and reliability

ABB's new line of industrial motor control and protection devices has been developed in order to meet the main safety standards of the toughest industrial scenarios where high reliability and safety level are required.

Increased availability for your equipment

Designing with simplicity in mind, our engineers have made it possible to integrate the entire family into just a few components. We offer you reduced inventory, greater exchangeability, to help you to have fewer mistakes and shortages and less down time.

Energy efficiency and sustainability

Reducing energy consumption and protecting the environment has long been at the top of ABB's list of priorities, and we are proud to introduce a first-class proposal.

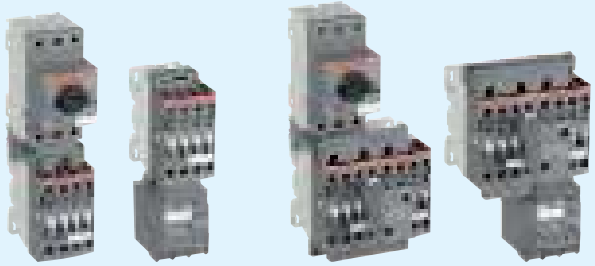
1SBC101105S0202

Large choice of starting solutions in kit form

Short-circuit and overload protection
- Type 1 or type 2 coordination guaranteed with manual motor starters
- Choice of thermal or electronic overload relays

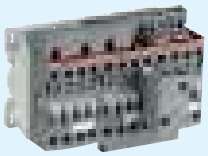
Simple construction
- All starters in 45 mm width module

Time/cost saving
- Same frame size for AC or DC control supply
- Easy, fast and secure assembly, fitting and wiring of components



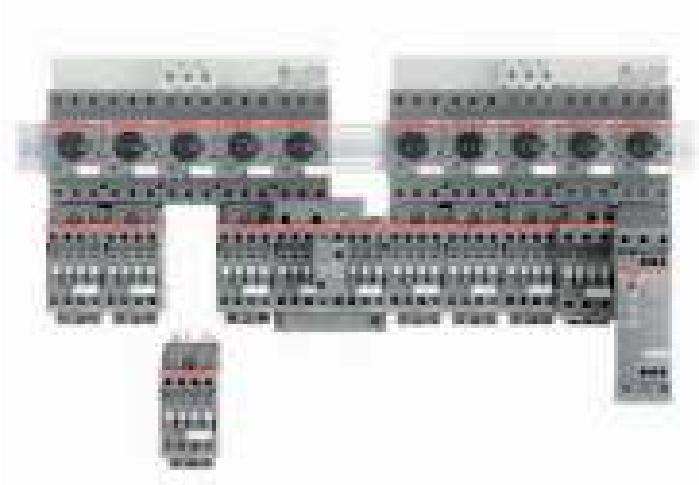
Direct-on-line and reversing starters
- Protection by manual motor starters or by fuses with overload relays
- Reversing starters in 90 mm width including mechanical and electrical interlocking

Softstarters
Protection by manual motor starters or by fuses with overload relays



Star-delta starters
Protection by fuses with overload relays

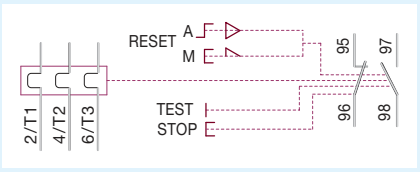
Standardized busbars and optimized interconnection accessories
- Same 3-phase busbar and feeder range up to 100 A for manual motor starters
- Direct 35 mm rail mounting: no additional mounting plate required
- Complete range of connection links with manual motor starters and connection sets to build reversing and star-delta starters
- Easy installation and dismounting of contactors: no unwiring of manual motor starters

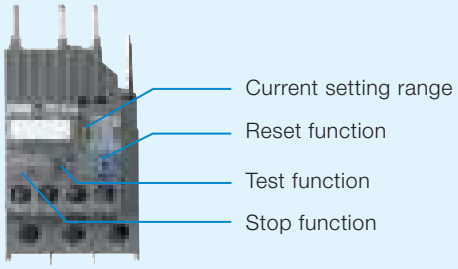


1SBC101105S0202

Protect your motors with thermal or electronic overload relays

- One range of TF42 thermal overload relays, trip class 10
- One range of EF19 and EF45 electronic overload relays up to 45 A, 7 setting ranges, trip class 10E, 20E, 30E
- Adjustable current setting ranges
- Overload protection with phase loss sensitivity
- Temperature compensation:
  - up to +60 °C for thermal overload relays
  - up to +70 °C for electronic overload relays
- Automatic or manual reset, sealable
- Stop and test function

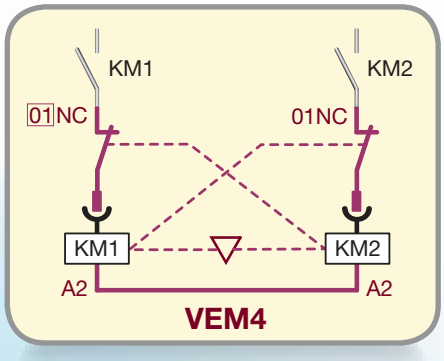




Interlock your reversing contactors quickly in 90 mm width:

- Easy with VM4 mechanical interlock unit
- Simple with VEM4 set including mechanical interlock unit and electrical interlock block with A2-A2 connection
- 50% wiring cost savings in one click!

Fixing the electrical interlock block to the contactor front face connects the 2 built-in N.C. interlocking contacts with the two coil supplies



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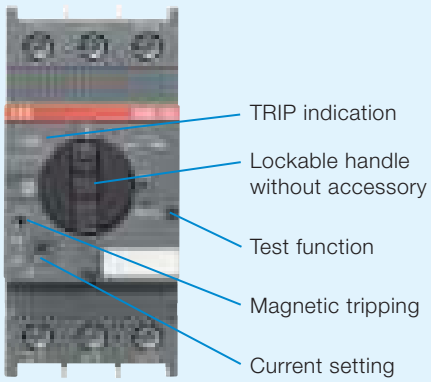
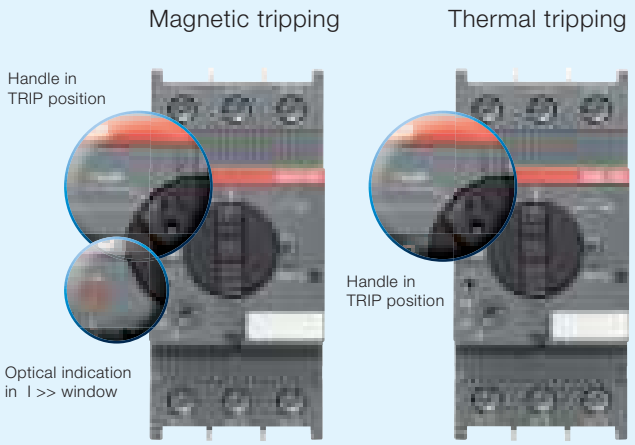
MS116 and MS132 manual motor starters
Harmonized design in 45 mm width

Types	MS116	MS132
Setting range	0.1 ... 32 A	0.1 ... 32 A
Switch position	ON / OFF	ON / OFF / TRIP
Magnetic trip indication	–	yes
Lockable handle without accessories	–	yes
Max. breaking capacity I_{cs}	up to 50 kA	up to 100 kA
Trip class	10A	10

ON/OFF switch functionality

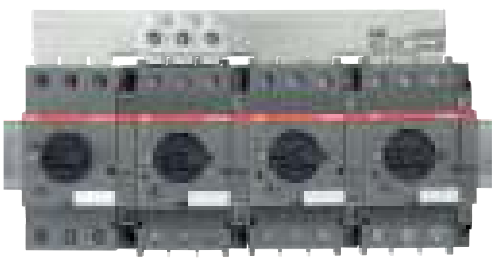


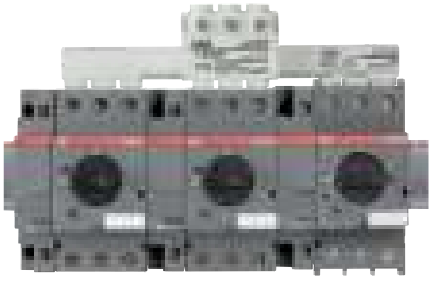
Clear tripping identification



One range of accessories for MS116 and MS132

- Common auxiliary contacts, signaling contacts and auxiliary trip units
- Common busbar systems





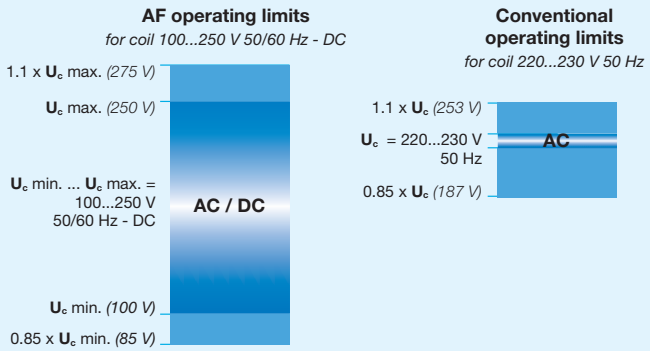
1SBC101105S0202

AF09 ... AF38 3-pole contactors
Simple design with 2 frame sizes in 45 mm width

Types	AF09	AF12	AF16	AF26	AF30	AF38
Rated operational power 400 V AC-3	4 kW	5.5 kW	7.5 kW	11 kW	15 kW	18.5 kW
Rated operational current AC-1 (40 °C)	25 A	28 A	30 A	45 A	50 A	50 A
UL 3-phase motor power 480 V	5 hp	7.5 hp	10 hp	15 hp	20 hp	20 hp

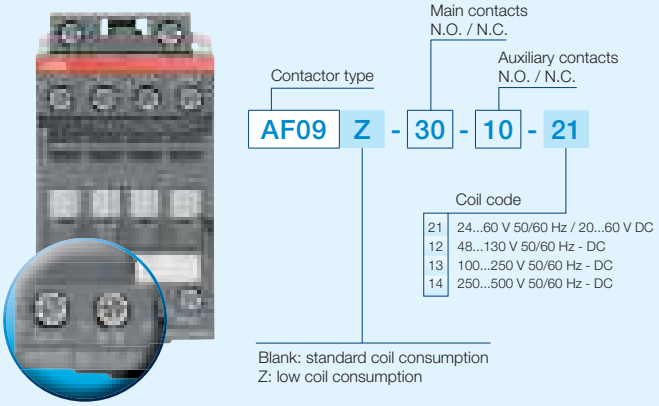
A unique contactor for AC or DC control supply

- Manages large control voltage variations
- Includes an electronic coil interface with extended operating limits 0.85 x U_c min. ... 1.1 x U_c max.



Only four coils for easier selection

Control voltages covering 24...500 V 50/60 Hz and 20...500 V DC



Reduced panel energy consumption

- With low holding AC and DC coil consumption
- From 30% (AF coil) to 80% (AF..Z coil) reduction of AC pull-in consumption

Built-in surge protection

- No extra surge suppressor required

Improve your equipment reliability with AF..Z contactors

- Withstands control voltage short dips
- Withstands control voltage sags according to SEMI F47-0706 standards
- Additional AF..Z coils available for control voltages between 12...20 V DC and 48...250 V 50/60 Hz - DC

Direct control by PLC-output ≥ 500 mA, 24 V DC

No use of interface relay

1SBC101105S0202

Switching of auxiliary and control circuits

Optimize your auxiliary contact block configuration

– AF09...AF16 3-pole contactors equipped with a built-in auxiliary contact N.O. or N.C.
– Up to 6 additional auxiliary contacts:
  - front-mounted 1 or 4-pole CA4 blocks
  - side-mounted 2-pole CAL4 blocks
– Reduced panel dimension using up to 2 side-mounted 2-pole CAL4 blocks

Make your control circuit safe

– **Mirror contact** .....
according to IEC 60947-4-1 Annex F 2.1

– **Mechanically linked contacts** .....
according to IEC 60947-5-1 Annex L 3.0

Free choice of your coil terminal access

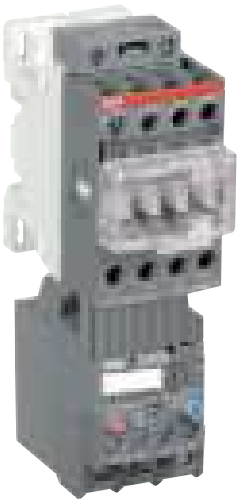
Top-mounted coil terminal block

Coil terminal block transferable to bottom position

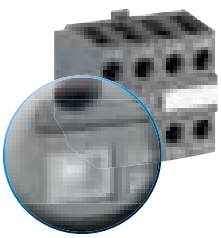
Additional LDC4 coil terminal block mounted in bottom position

Front-mounted 2-pole CAT4 auxiliary contact block for front coil connection

Protect your equipment against accidental contact



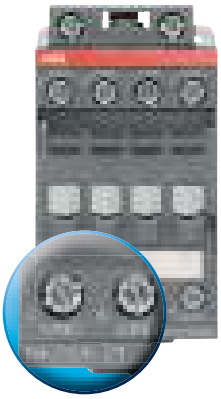
Sealable and transparent protective covers on contactors (BX4) and overload relays

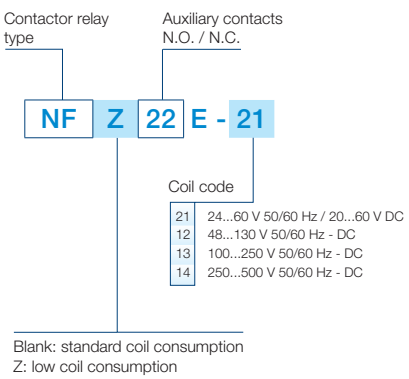


Non-removable protective covers (BX4-CA) for auxiliary contact blocks

Complete choice of contactor relays

– Same advantages and accessories as AF contactors
– Only four coils for easier selection





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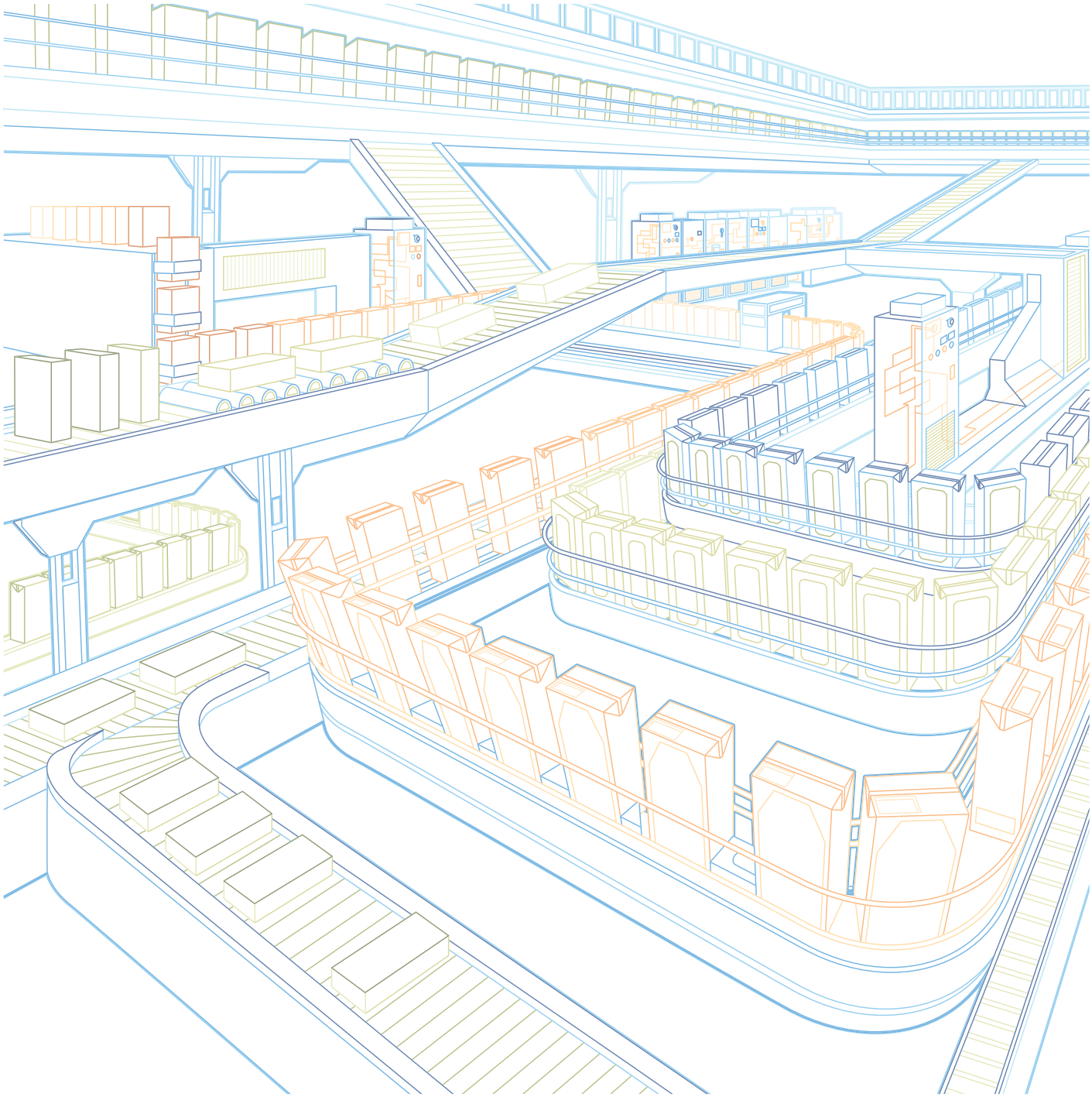


Manual motor starters

0.10 to 32 A – with thermal and electromagnetic protection

Ics up to 50 kA

MS116 manual motor starters **2**/2
Technical data **2**/3
Main accessories **2**/6

Ics up to 100 kA

MS132 manual motor starters **2**/10
Technical data **2**/11
Main accessories **2**/14

0.10 to 32 A – with electromagnetic protection

MO132 manual motor starters **2**/18
Technical data **2**/19
Main accessories **2**/23

22 to 100 A – with thermal and electromagnetic protection

MS450, MS495, MS497 manual motor starters **2**/24
Technical data **2**/25
Main accessories **2**/27

16 to 100 A – with electromagnetic protection

MO450, MO495, MO496 manual motor starters **2**/32
Technical data **2**/33
Main accessories **2**/35

0.10 to 25 A – with thermal and electromagnetic protection

MS325 manual motor starters **2**/40
Technical data **2**/41
Main accessories **2**/44

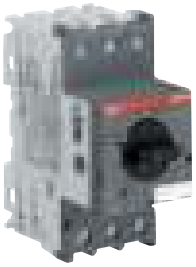
0.4 to 25 A – with electromagnetic protection

MO325 manual motor starters **2**/49
Technical data **2**/50
Main accessories **2**/52

MS116 manual motor starters
0.10 to 32 A – with thermal and electromagnetic protection

2CDC241010F0011

MS116-16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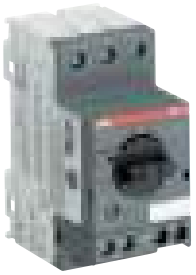
MS116-25


2CDC241013F0011

MS116-0.16-HKF1-11

2CDC241012F0011

MS116-32-HKF1-11

Description

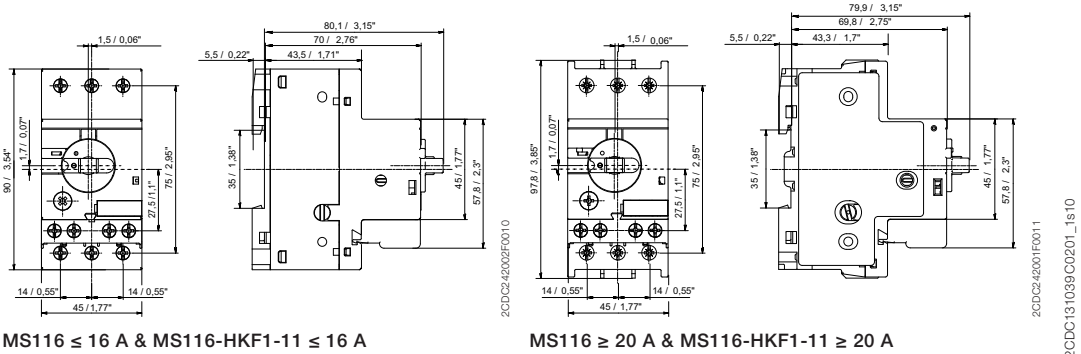
Manual motor starters (MMS) are protection devices for the main circuit. They combine motor control and protection in a single device. MMS are used mainly to switch motors manually ON/OFF and protect them and the installation fuse less against short-circuit, overload and phase failures. Fuse less protection with a manual motor starter saves costs, space and ensures a quick reaction under short-circuit condition, by switching off the motor within milliseconds.

MS116 is a compact and economic range for motor protection up to 7.5 kW (400 V) / 32 A in width of 45 mm. Further features are the build-in disconnect function, temperature compensation, trip-free mechanism and a rotary handle with a clear switch position indication. The manual motor starter is suitable for three- and single-phase applications. Auxiliary contacts, signalling contacts, undervoltage releases, shunt trips, three-phase bus bars, power in-feed blocks and locking devices for protection against unauthorized changes are available as accessory.

Ordering details

Rated operational power 400 V AC-3	Rated operational current	Short-circuit breaking capacity I_{cs} at 400 V AC	Rated instantaneous short-circuit current setting I_i	Type	Order code		Weight (1 pce)
kW	A	kA	A				kg
0.03	0.10 ... 0.16	50	1.56	MS116-0.16	1SAM250000R1001		0.225
0.06	0.16 ... 0.25	50	2.44	MS116-0.25	1SAM250000R1002		0.225
0.09	0.25 ... 0.40	50	3.90	MS116-0.4	1SAM250000R1003		0.225
0.12	0.40 ... 0.63	50	6.14	MS116-0.63	1SAM250000R1004		0.225
0.25	0.63 ... 1.00	50	11.50	MS116-1.0	1SAM250000R1005		0.225
0.55	1.00 ... 1.60	50	18.40	MS116-1.6	1SAM250000R1006		0.265
0.75	1.60 ... 2.50	50	28.75	MS116-2.5	1SAM250000R1007		0.265
1.5	2.50 ... 4.00	50	50.00	MS116-4.0	1SAM250000R1008		0.265
2.2	4.00 ... 6.30	50	78.75	MS116-6.3	1SAM250000R1009		0.265
4.0	6.30 ... 10.0	50	150	MS116-10	1SAM250000R1010		0.265
5.5	8.00 ... 12.0	25	180	MS116-12	1SAM250000R1012		0.265
7.5	10.0 ... 16.0	16	240	MS116-16	1SAM250000R1011		0.265
9.0	16.0 ... 20.0	10	300	MS116-20	1SAM250000R1013		0.310
12.5	20.0 ... 25.0	10	375	MS116-25	1SAM250000R1014		0.310
15.5	25.0 ... 32.0	10	480	MS116-32	1SAM250000R1015		0.310
0.03	0.10 ... 0.16	50	1.56	MS116-0.16-HKF1-11	1SAM250005R1001		0.240
0.06	0.16 ... 0.25	50	2.44	MS116-0.25-HKF1-11	1SAM250005R1002		0.240
0.09	0.25 ... 0.40	50	3.90	MS116-0.4-HKF1-11	1SAM250005R1003		0.240
0.12	0.40 ... 0.63	50	6.14	MS116-0.63-HKF1-11	1SAM250005R1004		0.240
0.25	0.63 ... 1.00	50	11.50	MS116-1.0-HKF1-11	1SAM250005R1005		0.240
0.55	1.00 ... 1.60	50	18.40	MS116-1.6-HKF1-11	1SAM250005R1006		0.280
0.75	1.60 ... 2.50	50	28.75	MS116-2.5-HKF1-11	1SAM250005R1007		0.280
1.5	2.50 ... 4.00	50	50.00	MS116-4.0-HKF1-11	1SAM250005R1008		0.280
2.2	4.00 ... 6.30	50	78.75	MS116-6.3-HKF1-11	1SAM250005R1009		0.280
4.0	6.30 ... 10.0	50	150	MS116-10.0-HKF1-11	1SAM250005R1010		0.280
5.5	8.00 ... 12.0	25	180	MS116-12.0-HKF1-11	1SAM250005R1012		0.280
7.5	10.0 ... 16.0	16	240	MS116-16.0-HKF1-11	1SAM250005R1011		0.280
9.0	16.0 ... 20.0	10	300	MS116-20-HKF1-11	1SAM250005R1013		0.326
12.5	20.0 ... 25.0	10	375	MS116-25-HKF1-11	1SAM250005R1014		0.326
15.5	25.0 ... 32.0	10	480	MS116-32-HKF1-11	1SAM250005R1015		0.326

Main dimensions mm, *inches*



MS116 ≤ 16 A & MS116-HKF1-11 ≤ 16 A

MS116 ≥ 20 A & MS116-HKF1-11 ≥ 20 A

2CDC131039C0201_1s10

MS116 manual motor starters
Technical data

Main circuit – Utilization characteristics according to IEC/EN

Type	MS116
Standards	IEC/EN 60947–2, IEC/EN 60947-4-1, IEC/EN 60947-1
Rated operational voltage U_e	690 V AC
Rated frequency	50/60 Hz
Trip class	10A
Number of poles	3
Duty time	100 %
Rated impulse withstand voltage U_{imp}	6 kV
Rated insulation voltage U_i	690 V AC
Rated operational current I_e	See ordering details
Rated instantaneous short-circuit current setting I_i	See ordering details
Rated service short-circuit breaking capacity I_{cs}	See table "Short-circuit breaking capacity and back-up fuses"
Rated ultimate short-circuit breaking capacity I_{cu}	See table "Short-circuit breaking capacity and back-up fuses"

Short-circuit breaking capacity and back-up fuses

I_{cs} Rated service short-circuit breaking capacity

I_{cu} Rated ultimate short-circuit breaking capacity

I_{cc} Prospective short-circuit current at installation location

Note: Maximum rated current of the back-up fuses if $I_{cc} > I_{cs}$

Type	230 V AC			400 V AC			440 V AC			500 V AC			690 V AC		
	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A
MS116-0.16	No back-up fuse required up to I_{cc} = 50 kA									No back-up fuse required up to I_{cc} = 30 kA					
MS116-0.25															
MS116-0.4															
MS116-0.63															
MS116-1.0															
MS116-1.6															
MS116-2.5							10	10	25	10	10	25	5	5	25
MS116-4.0							6	6	25	6	6	25	2	2	25
MS116-6.3							6	6	63	6	6	63	2	2	40
MS116-10							6	6	63	6	6	63	2	2	50
MS116-12	25	25	80	25	25	80	6	6	63	6	6	63	2	2	50
MS116-16	16	16	80	16	16	80	6	6	63	4	4	63	2	2	63
MS116-20	10	15	-	10	15	-	3	6	-	3	4	-	2	2	-
MS116-25	10	15	-	10	15	-	3	6	-	3	4	-	2	2	-
MS116-32	10	10	-	10	10	-	3	6	-	3	4	-	2	2	-

MS116-10: No need for back-up fuse in networks with a prospective current of up to 50 kA at 400 V.
MS116-16: No need for back-up fuse in networks with a prospective current of up to 16 kA at 400 V.
With an approbiate 80 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA.
MS116-32: No need for back-up fuse in networks with a prospective current of up to 15 kA at 400 V.

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MS116 manual motor starters
Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type		MS116
Standards		UL 508, CSA 22.2 No. 14
Maximum operational voltage		600 V AC
Manual motor controller ratings		See table "UL 508 – Manual motor controller"
Trip rating		125 % FLA
Motor ratings	Horse power	See table "Motor rating, three phase"
	Full load amps (FLA)	See table "Motor rating, three phase"
	Locked rotor amps (LRA)	See table "Motor rating, three phase"

Motor rating, three phase

hp Horse power

FLA Full load amps

LRA Locked rotor amps

Type	110-120 V AC			220-240 V AC			440-480 V AC			500-600 V AC		
	hp	FLA	LRA	hp	FLA	LRA	hp	FLA	LRA	hp	FLA	LRA
MS116-0.16	-	0.16	0.96	-	0.16	0.96	-	0.16	0.96	-	0.16	0.96
MS116-0.25	-	0.25	1.5	-	0.25	1.5	-	0.25	1.5	-	0.25	1.5
MS116-0.4	-	0.4	2.4	-	0.4	2.4	-	0.4	2.4	-	0.4	2.4
MS116-0.63	-	0.63	3.78	-	0.63	3.78	-	0.63	3.78	-	0.63	3.78
MS116-1.0	-	1.0	6.0	-	1.0	6.0		1.0	6.0	1/2	0.9	8
MS116-1.6	-	1.6	9.6	-	1.6	9.6	3/4	1.6	12.5	3/4	1.3	10
MS116-2.5	-	2.5	15.0	1/2	2.2	20	1	2.1	15	1-1/2	2.4	16
MS116-4.0	-	4.0	16.0	1	4.2	30	2	3.4	25	3	3.9	25.6
MS116-6.3	1/2	4.4	40	1-1/2	6.4	40	3	4.8	32	5	6.1	36.8
MS116-10	1	8.4	60	3	9.6	64	5	7.6	46	7-1/2	9	50.8
MS116-12	1-1/2	12	80	3	9.6	64	7-1/2	11	63.5	10	11	64.8
MS116-16	2	13.6	100	5	15.2	92	10	14	81	10	11	64.8
MS116-20	3	19.2	128	5	15.2	92	10	14	81	15	17	93
MS116-25	3	19.2	128	7-1/2	22	127	15	21	116	20	22	116
MS116-32	5	30.4	184	10	28	162	20	27	145	25	27	146

UL 508 – Manual motor controller

Type	Maximum fuse type K5 o. RK5 per UL/NEC	Maximum short-circuit current for motor disconnect[1]		for group installation	
	480 V / 600 V	480 V	600 V	480 V	600 V
	A	kA	kA	kA	kA
MS116-0.16	100	30	5	18	5
MS116-0.25	100	30	5	18	5
MS116-0.4	100	30	5	18	5
MS116-0.63	100	30	5	18	5
MS116-1.0	100	30	5	18	5
MS116-1.6	100	30	5	18	5
MS116-2.5	100	30	5	18	5
MS116-4.0	100	18	5	18	5
MS116-6.3	100	18	5	18	5
MS116-10	100	18	5	18	5
MS116-12	100	18	5	18	5
MS116-16	100	18	5	18	5
MS116-20	100	18	5	18	5
MS116-25	100	18	5	18	5
MS116-32	100	18	5	18	5

[1] Suitable as motor disconnect only when provided with padlock SA1 or SA3...

2CDC131039C0201_3s10

MS116 manual motor starters
Technical data

General technical data

Type		MS116
Pollution degree		3
Phase loss sensitive		Yes
Ambient air temperature		
Operation	Open - compensated without derating	-25 ... +55 °C
	Open	-25 ... +70 °C
	Enclosed (IB132)	0 ... +40 °C
Storage		-50 ... +80 °C
Ambient air temperature compensation		Continuous
Maximum operating altitude permissible		2000 m
Resistance to shock acc. to IEC 60068-2-27		25 g / 11 ms
Resistance to vibrations acc. to IEC 60068-2-6		5 g / 3 ... 150 Hz
Mounting position		Position 1-6 (optional for single mounting)
Mounting		DIN-rail (EN 60715)
Group mounting		On request
Minimum distance to other units same type	Horizontal	0 mm
	Vertical	150 mm
Minimum distance to electrical conductive board	Horizontal, up to 400 V	0 mm
	Horizontal, up to 690 V	> 1.5 mm
	Vertical	75 mm
Degree of protection	Enclosure / terminals	IP20

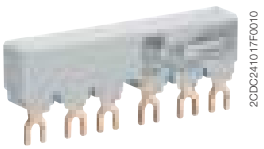
Connecting characteristics

Main circuit

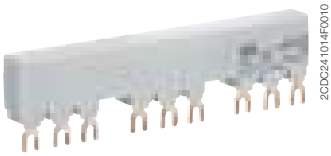
			MS116 ≤ 16 A	MS116 ≥ 20 A
Type				
Connecting capacity				
Solid		**1 or 2 x**	1 ... 4 mm²	2.5 ... 6 mm²
Flexible		**1 or 2 x**	0.75 ... 2.5 mm²	1 ... 6 mm²
	Stranded acc. to UL/CSA	**1 or 2 x**	AWG 16-12	AWG 12-8
	Flexible acc. to UL/CSA	**1 or 2 x**	AWG 16-12	AWG 12-8
Stripping length			9 mm	10 mm
Tightening torques			0.8 ... 1.2 Nm / 10 ... 12 lb.in	2.0 Nm / 18 lb.in
Connection screw			M3.5 (Pozidriv 2 / 5.5 mm)	M4 (Pozidriv 2 / 6.5 mm)

2CDC131039C0201_4s10

MS116 manual motor starters
Main accessories



PS1-2-0-65



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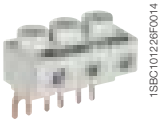

S1-M1-25

S1-M2-25

SA1

Description

Three-phase busbars ensure a quick and safe connection and are therefore a cost effective solution. A variety of different three-phase busbars up to 100 A are in the assortment. Between 2 and 5 manual motor starters with none, one or two lateral auxiliary contacts can be connected. Different three-phase feeder terminals are available according to the application.

Ordering details

Rated operational current A	Number of MMS	Number of lateral aux.	Type	Order code		Pkg qty	Weight (1 pce) kg
Three-phase busbars							
65	2	0	PS1-2-0-65	1SAM201906R1102		10	0.034
65	3	0	PS1-3-0-65	1SAM201906R1103		10	0.055
65	4	0	PS1-4-0-65	1SAM201906R1104		10	0.077
65	5	0	PS1-5-0-65	1SAM201906R1105		10	0.098
65	2	1	PS1-2-1-65	1SAM201906R1112		10	0.036
65	3	1	PS1-3-1-65	1SAM201906R1113		10	0.060
65	4	1	PS1-4-1-65	1SAM201906R1114		10	0.087
65	5	1	PS1-5-1-65	1SAM201906R1115		10	0.108
65	2	2	PS1-2-2-65	1SAM201906R1122		10	0.040
65	3	2	PS1-3-2-65	1SAM201906R1123		10	0.067
65	4	2	PS1-4-2-65	1SAM201906R1124		10	0.095
65	5	2	PS1-5-2-65	1SAM201906R1125		10	0.122
100	3	0	PS1-3-0-100	1SAM201916R1103		10	0.084
100	4	0	PS1-4-0-100	1SAM201916R1104		10	0.117
100	5	0	PS1-5-0-100	1SAM201916R1105		10	0.154
100	3	1	PS1-3-1-100	1SAM201916R1113		10	0.094
100	4	1	PS1-4-1-100	1SAM201916R1114		10	0.134
100	5	1	PS1-5-1-100	1SAM201916R1115		10	0.172
100	3	2	PS1-3-2-100	1SAM201916R1123		10	0.105

Rated operational current A	Rated cross section mm²	Mounting form	Type	Order code		Pkg qty	Weight (1 pce) kg
Three-phase feeder terminals							
65	25	Flat	S1-M1-25	1SAM201907R1101		10	0.038
65	25	High	S1-M2-25	1SAM201907R1102		10	0.051
65	25	UL type E and IEC	S1-M3-25	1SAM201907R1103		10	0.042
100	35	UL type E and IEC	S1-M3-35	1SAM201913R1103		10	0.060

Description	Type	Order code		Pkg qty	Weight (1 pce) kg
Protection cover for busbars	BS1-3	1SAM201908R1001		50	0.003
Lock handle	SA1	GJF1101903R0001		10	0.003
Padlock	SA2	GJF1101903R0002		10	0.020
Lock handle box SA1/SA2	SA3	GJF1101903R0003		10	0.050
Screw fixing kit	FS116	1SAM201909R1001		1	0.020

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MS116 manual motor starters
Main accessories

HKF1-11

HK1-11

SK1-11

AA1-24

UA1-24

Description

MS116 manual motor starters can be equipped with auxiliary contacts for lateral/front mounting, signalling contact for lateral mounting, undervoltage release and shunt trips. The accessories can be fitted wiring free and without tools. A variety of combinations is possible as required for the application. The auxiliary contacts change position with the main contacts. The signalling contact signals tripping regardless if it was caused by short-circuit or overload. Undervoltage release are used for remote tripping of the manual motor starter especially for emergency stop circuits. Shunt trips release the MMS used for remote tripping.

Ordering details

Auxiliary contacts N.O.	Auxiliary contacts N.C.	Description	Type	Order code		Pkg qty	Weight (1 pce) kg
Auxiliary contacts – mountable on the front							
1	1		HKF1-11	1SAM201901R1001		10	0.015
Auxiliary contacts – mountable on the right							
1	1	max. 2 pieces	HK1-11	1SAM201902R1001		2	0.035
2	0	max. 2 pieces	HK1-20	1SAM201902R1002		2	0.035
0	2	max. 2 pieces	HK1-02	1SAM201902R1003		2	0.035
2	0	with lead contacts	HK1-20L	1SAM201902R1004		2	0.035
Signalling contacts – mountable on the right							
1	1	for tripped alarm, max. 2 pieces	SK1-11	1SAM201903R1001		2	0.035
2	0	for tripped alarm, max. 2 pieces	SK1-20	1SAM201903R1002		2	0.035
0	2	for tripped alarm, max. 2 pieces	SK1-02	1SAM201903R1003		2	0.035

Rated control supply voltage V	Frequency Hz	Type	Order code		Pkg qty	Weight (1 pce) kg
Shunt trip units – mountable on the left						
24	50/60	AA1-24	1SAM201910R1001		1	0.100
110	50/60	AA1-110	1SAM201910R1002		1	0.100
200 ... 240	50/60	AA1-230	1SAM201910R1003		1	0.100
350 ... 415	50/60	AA1-400	1SAM201910R1004		1	0.100
Undervoltage releases – mountable on the left						
24	50	UA1-24	1SAM201904R1001		1	0.100
48	50	UA1-48	1SAM201904R1002		1	0.100
60	50	UA1-60	1SAM201904R1003		1	0.100
110 ... 120	50/60	UA1-120	1SAM201904R1004		1	0.100
208	60	UA1-208	1SAM201904R1005		1	0.100
230 ... 240	50/60	UA1-230	1SAM201904R1006		1	0.100
400	50	UA1-400	1SAM201904R1007		1	0.100
415 ... 480	50/60	UA1-415	1SAM201904R1008		1	0.100

2CDC131039C0201_6s10

MS116 manual motor starters
Main accessories

IB132-Y

IB132-G

DMS132-Y

DMS132-G

Description

IB132 are IP65 enclosures for single MMS installation. Additional mounting of auxiliary and signalling contacts, shunt trips and undervoltage release is possible. The handle is lockable in OFF position. For detailed specification see installation instruction.

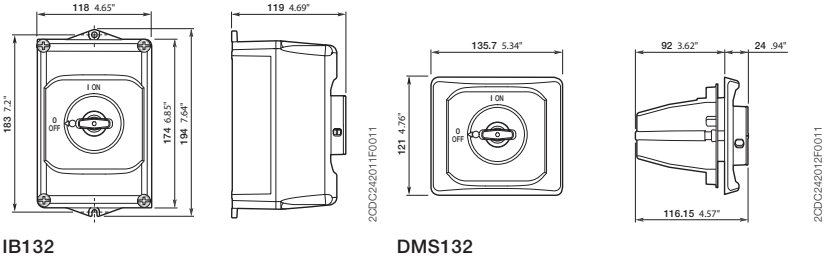
DMS132 are IP65 door mounting kits for MMS installation in any enclosure. Additional mounting of auxiliary, signalling, shunt trips and undervoltage release is possible. The handle is lockable in OFF position. For detailed specification see installation instruction.

Ordering details

Description	Color	Type	Order code		Pkg qty	Weight (1 pce) kg
Enclosures IP65						
Padlockable max. 3 padlocks with bail diameter 4 ... 6.5 mm	Yellow/red	IB132-Y	1SAM201911R1011		1	0.370
	Grey/black	IB132-G	1SAM201911R1010		1	0.370
Door mounting kit IP65						
Padlockable max. 3 padlocks with bail diameter 4 ... 6.5 mm	Yellow/red	DMS132-Y	1SAM201912R1011		1	0.170
	Grey/black	DMS132-G	1SAM201912R1010		1	0.170

Indication I-O-T and ON-OFF-T

Main dimensions mm, *inches*



IB132

DMS132

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MS116 manual motor starters
Main accessories

MSHD-LB

MSHD-LY

MSMN

MSOX-30

Description
The complete set includes handle, shaft and driver. All accessories fit 6 mm shafts of maximum 180 mm length. The degree of protection for handles MSHD is IP64.

Ordering details

Description	Shaft length mm	Type	Order code		Pkg qty	Weight (1 pce) kg
Shafts						
For selector type handles. Shaft diameter 6 mm. Shaft extension for door coupling driver.	85	OXS6X85	1SCA101647R1001		1	0.020
	105	OXS6X105	1SCA108043R1001		1	0.020
	130	OXS6X130	1SCA101655R1001		1	0.030
	180	OXS6X180	1SCA101659R1001		1	0.040

Description	Color	Type	Order code		Pkg qty	Weight (1 pce) kg
Selector type handles IP64						
Padlockable max. 3 padlocks with bail diameter 5 ... 8 mm, door interlock in ON position defeatable, for use with 6 mm OXS6...types up to 180 mm or driver shafts MSOX.	Black	MSHD-LB [1]	1SAM201920R1001		1	0.065
	Yellow	MSHD-LY	1SAM201920R1002		1	0.065

[1] Indication I-O and ON-OFF

Description	Type	Order code		Pkg qty	Weight (1 pce) kg
Driver					
Coupling driver for use with 6 mm OXS6... types up to 180 mm.	MSMN [1]	1SAM101923R0002		1	0.002
	MSMNO [2]	1SAM101923R0012		1	0.002

[1] Coded - Positioning of ON indication dependent from mounting orientation of the MS
[2] Uncoded - Positioning of ON indication independent from mounting orientation of the MS

Description	Shaft length mm	Type	Order code		Pkg qty	Weight (1 pce) kg
Driver shafts						
Driver shaft - combination driver & shaft. Shaft diameter 6 mm.	32	MSOX-32 [1]	1SAM101924R0003		1	0.010
	30	MSOX-30 [2]	1SAM101924R0013		1	0.010

[1] MSOX-32 is for normal vertical use
[2] MSOX-30 is for horizontal use

2CDC131039C0201_10s10

MS132 manual motor starters
0.10 to 32 A – with thermal and electromagnetic protection

1SBC101232F0010

MS132-10

2CDC241001F0011

MS132-32

2CDC241014F0011

MS132-0.16-HKF1-11

2CDC241015F0011

MS132-32-HKF1-11

Description

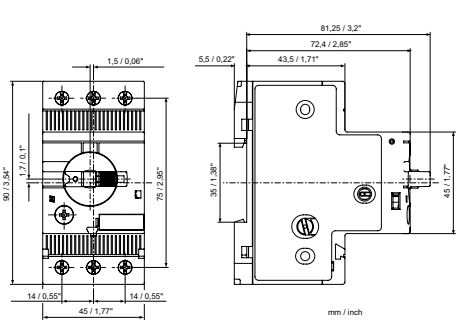
Manual motor starters (MMS) are protection devices for the main circuit. They combine motor control and protection in a single device. MMS are used mainly to switch motors manually ON/OFF and protect them and the installation fuse less against short-circuit, overload and phase failures. Fuse less protection with a manual motor starter saves costs, space and ensures a quick reaction under short-circuit condition, by switching off the motor within milliseconds.

MS132 is a compact and powerful range for motor protection up 15 kW (400 V) / 32 A in width of 45 mm. Further features are the build-in disconnect function, temperature compensation, trip-free mechanism and a rotary handle with a clear switch position indication. The manual motor starter is suitable for three- and single-phase applications. The handle is lockable to protect against unauthorized changes. Auxiliary contacts, signalling contacts, undervoltage releases, shunt trips, three-phase bus bars, power in-feed blocks.

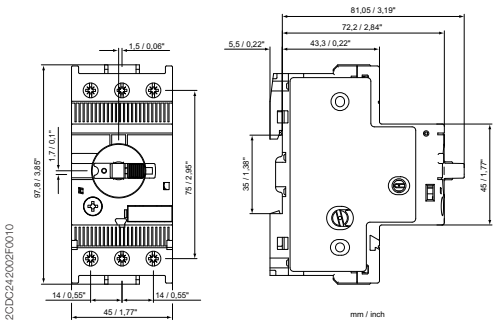
Ordering details

Rated operational power 400 V AC-3	Setting range	Short-circuit breaking capacity I_{cs} at 400 V AC	Rated instantaneous short-circuit current setting I_i	Type	Order code		Weight (1 pce)
kW	A	kA	A				kg
0.03	0.10 ... 0.16	100	1.56	MS132-0.16	1SAM350000R1001		0.215
0.06	0.16 ... 0.25	100	2.44	MS132-0.25	1SAM350000R1002		0.215
0.09	0.25 ... 0.40	100	3.90	MS132-0.4	1SAM350000R1003		0.215
0.12	0.40 ... 0.63	100	6.14	MS132-0.63	1SAM350000R1004		0.215
0.25	0.63 ... 1.00	100	11.50	MS132-1.0	1SAM350000R1005		0.215
0.55	1.00 ... 1.60	100	18.40	MS132-1.6	1SAM350000R1006		0.265
0.75	1.60 ... 2.50	100	28.75	MS132-2.5	1SAM350000R1007		0.265
1.5	2.50 ... 4.00	100	50.00	MS132-4.0	1SAM350000R1008		0.265
2.2	4.00 ... 6.30	100	78.75	MS132-6.3	1SAM350000R1009		0.265
4.0	6.30 ... 10.0	100	150	MS132-10	1SAM350000R1010		0.265
5.5	8.00 ... 12.0	100	180	MS132-12	1SAM350000R1012		0.310
7.5	10.0 ... 16.0	100	240	MS132-16	1SAM350000R1011		0.310
9.0	16.0 ... 20.0	100	300	MS132-20	1SAM350000R1013		0.310
12.5	20.0 ... 25.0	50	375	MS132-25	1SAM350000R1014		0.310
15.5	25.0 ... 32.0	25	480	MS132-32	1SAM350000R1015		0.310
0.03	0.10 ... 0.16	100	1.56	MS132-0.16-HKF1-11	1SAM350005R1001		0.231
0.06	0.16 ... 0.25	100	2.44	MS132-0.25-HKF1-11	1SAM350005R1002		0.231
0.09	0.25 ... 0.40	100	3.90	MS132-0.4-HKF1-11	1SAM350005R1003		0.231
0.12	0.40 ... 0.63	100	6.14	MS132-0.63-HKF1-11	1SAM350005R1004		0.231
0.25	0.63 ... 1.00	100	11.50	MS132-1.0-HKF1-11	1SAM350005R1005		0.231
0.55	1.00 ... 1.60	100	18.40	MS132-1.6-HKF1-11	1SAM350005R1006		0.281
0.75	1.60 ... 2.50	100	28.75	MS132-2.5-HKF1-11	1SAM350005R1007		0.281
1.5	2.50 ... 4.00	100	50.00	MS132-4.0-HKF1-11	1SAM350005R1008		0.281
2.2	4.00 ... 6.30	100	78.75	MS132-6.3-HKF1-11	1SAM350005R1009		0.281
4.0	6.30 ... 10.0	100	150	MS132-10.0-HKF1-11	1SAM350005R1010		0.281
5.5	8.00 ... 12.0	100	180	MS132-12.0-HKF1-11	1SAM350005R1012		0.326
7.5	10.0 ... 16.0	100	240	MS132-16.0-HKF1-11	1SAM350005R1011		0.326
9.0	16.0 ... 20.0	100	300	MS132-20-HKF1-11	1SAM350005R1013		0.326
12.5	20.0 ... 25.0	50	375	MS132-25-HKF1-11	1SAM350005R1014		0.326
15.5	25.0 ... 32.0	25	480	MS132-32-HKF1-11	1SAM350005R1015		0.326

Main dimensions mm, *inches*



MS132 ≤ 10 A



MS132 ≥ 12 A

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MS132 manual motor starters
Technical data

Main circuit – Utilization characteristics according to IEC/EN

Type	MS132
Standards	IEC/EN 60947–2, IEC/EN 60947-4-1, IEC/EN 60947-1
Rated operational voltage U_e	690 V AC / 250 V DC
Rated frequency	DC, 50/60 Hz
Trip class	10 (10A for 1SAM350000R1001)
Number of poles	3
Duty time	100 %
Rated impulse withstand voltage U_{imp}	6 kV
Rated insulation voltage U_i	690 V AC
Rated operational current I_e	See ordering details
Rated instantaneous short-circuit current setting I_i	See ordering details
Rated service short-circuit breaking capacity I_{cs}	See table "Short-circuit breaking capacity and back-up fuses"
Rated ultimate short-circuit breaking capacity I_{cu}	See table "Short-circuit breaking capacity and back-up fuses"

Short-circuit breaking capacity and back-up fuses

I_{cs} Rated service short-circuit breaking capacity

I_{cu} Rated ultimate short-circuit breaking capacity

I_{cc} Prospective short-circuit current at installation location

Note: Maximum rated current of the back-up fuses if $I_{cc} > I_{cs}$

Type	230 V AC			400 V AC			440 V AC			500 V AC			690 V AC		
	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A
MS132-0.16															
MS132-0.25															
MS132-0.4															
MS132-0.63															
MS132-1.0	No back-up fuse required up to I_{cc} = 100 kA														
MS132-1.6															
MS132-2.5															
MS132-4.0							20	20	*	20	20	*	3	3	*
MS132-6.3							20	20	*	20	20	*	3	3	*
MS132-10							20	20	*	20	20	*	3	3	*
MS132-12							20	20	*	20	20	*	3	3	*
MS132-16							20	20	*	20	20	*	3	3	*
MS132-20							20	20	*	20	20	*	3	3	*
MS132-25	50	50	100	50	50	100	20	20	*	10	10	*	3	3	*
MS132-32	25	50	125	25	50	125	20	20	*	10	10	*	3	3	*

MS132-16: No need for back-up fuse in networks with a prospective current of up to 100 kA at 400 V.
MS132-32: No need for back-up fuse in networks with a prospective current of up to 50 kA at 400 V.
With an approbiate 125 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA

* not available yet

2CDC131040C0201_2s10

MS132 manual motor starters
Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type		MS132
Standards		UL 508, CSA 22.2 No. 14
Maximum operational voltage		600 V AC
Manual motor controller ratings		See table "UL 508 – Manual motor controller"
Trip rating		125 % FLA
Motor ratings	Horse power	See table "Motor rating, three phase"
	Full load amps (FLA)	See table "Motor rating, three phase"
	Locked rotor amps (LRA)	See table "Motor rating, three phase"

Motor rating, three phase

hp Horse power

FLA Full load amps

LRA Locked rotor amps

Type	110-120 V AC			220-240 V AC			440-480 V AC			500-600 V AC		
	hp	FLA	LRA	hp	FLA	LRA	hp	FLA	LRA	hp	FLA	LRA
MS132-0.16	-	0.16	0.96	-	0.16	0.96	-	0.16	0.96	-	0.16	0.96
MS132-0.25	-	0.25	1.5	-	0.25	1.5	-	0.25	1.5	-	0.25	1.5
MS132-0.4	-	0.4	2.4	-	0.4	2.4	-	0.4	2.4	-	0.4	2.4
MS132-0.63	-	0.63	3.78	-	0.63	3.78	-	0.63	3.78	-	0.63	3.78
MS132-1.0	-	1.0	6.0	-	1.0	6.0	-	1.0	6.0	1/2	1.0	6.0
MS132-1.6	-	1.6	9.6	-	1.6	9.6	3/4	1.6	9.6	3/4	1.6	9.6
MS132-2.5	-	2.5	15.0	1/2	2.5	15.0	1	2.5	15.0	1-1/2	2.5	15.0
MS132-4.0	-	4.0	24.0	1	4.0	24.0	2	4.0	24.0	3	3.9	26.0
MS132-6.3	1/2	6.3	37.8	1-1/2	6.3	37.8	3	4.8	32.0	5	6.1	37.0
MS132-10	3/4	10.0	60.0	3	9.6	64.0	5	7.6	46.0	7-1/2	9.0	51.0
MS132-12	1-1/2	12.0	72.0	3	9.6	64.0	7-1/2	11.0	64.0	10	11.0	65.0
MS132-16	2	16.0	84.0	5	15.2	92.0	10	14.0	81.0	10	11.0	65.0
MS132-20	3	19.2	128.0	5	15.2	92.0	10	14.0	81.0	15	17.0	93.0
MS132-25	3	19.2	128.0	7-1/2	22.0	127.0	15	21.0	116.0	20	22.0	116.0
MS132-32	5	30.4	184.0	10	28.0	162.0	20	27.0	145.0	25	27.0	146.0

UL 508 – Manual motor controller

Type	Maximum short-circuit current for motor disconnect[1)]		for group installation		for self-protected combination motor controller (type E) in combination with feeder block S1-M3-xx		for tap conductor protection	
	480 V kA	600 V kA	480 V kA	600 V kA	480Y / 277 V kA	600Y / 347 V kA	480 V kA	600 V kA
MS132-0.16	65	47	65	47	65	47	65	47
MS132-0.25	65	47	65	47	65	47	65	47
MS132-0.4	65	47	65	47	65	47	65	47
MS132-0.63	65	47	65	47	65	47	65	47
MS132-1.0	65	47	65	47	65	47	65	47
MS132-1.6	65	47	65	47	65	47	65	47
MS132-2.5	65	47	65	47	65	47	65	47
MS132-4.0	65	18	65	30	65	18	65	18
MS132-6.3	65	18	65	30	65	-	65	18
MS132-10	65	18	65	30	65	-	65	18
MS132-12	30	18	30	30	30	-	30	18
MS132-16	30	18	30	30	30	-	30	18
MS132-20	30	18	30	30	30	-	30	18
MS132-25	30	18	30	30	30	-	30	18
MS132-32	30	18	30	30	30	-	30	18

2CDC131040C0201_3s10

MS132 manual motor starters
Technical data

General technical data

Type		MS132
Pollution degree		3
Phase loss sensitive		Yes
Ambient air temperature		
Operation	Open - compensated without derating	-25 ... +60 °C
	Open	-25 ... +70 °C
	Enclosed (IB132)	0 ... +40 °C
Storage		-50 ... +80 °C
Ambient air temperature compensation		Continuous
Maximum operating altitude permissible		2000 m
Resistance to shock acc. to IEC 60068-2-27		25 g / 11 ms
Resistance to vibrations acc. to IEC 60068-2-6		5 g / 3 ... 150 Hz
Mounting position		Position 1-6 (optional for single mounting)
Mounting		DIN-rail (EN 60715)
Group mounting		On request
Minimum distance to other units same type	Horizontal	0 mm
	Vertical	150 mm
Minimum distance to electrical conductive board	Horizontal, up to 400 V	0 mm
	Horizontal, up to 690 V	> 1.5 mm
	Vertical	75 mm
Degree of protection	Enclosure / terminals	IP20

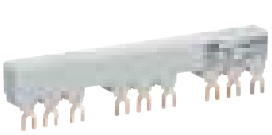
Connecting characteristics

Main circuit

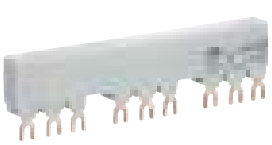
			MS132-0.16 ... MS132-10	MS132-12 ... MS132-16	MS132-20 ... MS132-32
Type					
Connecting capacity					
Solid		**1 or 2 x**	1 ... 4 mm²	1 ... 4 mm²	2.5 ... 6 mm²
Flexible		**1 or 2 x**	0.75 ... 2.5 mm²	0.75 ... 2.5 mm²	1 ... 6 mm²
	Stranded acc. to UL/CSA	**1 or 2 x**	AWG 16-12	AWG 16-12	AWG 12-8
	Flexible acc. to UL/CSA	**1 or 2 x**	AWG 16-12	AWG 16-12	AWG 12-8
Stripping length			9 mm	10 mm	10 mm
Tightening torques			0.8 ... 1.2 Nm / 10 ... 12 lb.in	1.5 Nm / 14 lb.in	2.0 Nm / 18 lb.in
Connection screw			M3.5 (Pozidriv 2)	M4 (Pozidriv 2)	M4 (Pozidriv 2)

2CDC131040C0201_4s10

MS132 manual motor starters
Main accessories



PS1-3-1-65



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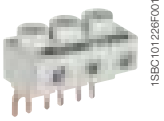

S1-M1-25

S1-M2-25

S1-M3-25

SA2

Description

Three-phase busbars ensure a quick and safe connection and are therefore a cost effective solution. A variety of different three-phase busbars up to 100 A are in the assortment. Between 2 and 5 manual motor starters with none, one or two lateral auxiliary contacts can be connected. Different three-phase feeder terminals are available according to the application.

Ordering details

Rated operational current A	Number of MMS	Number of lateral aux.	Type	Order code		Pkg qty	Weight (1 pce) kg
Three-phase busbars							
65	2	0	PS1-2-0-65	1SAM201906R1102		10	0.034
65	3	0	PS1-3-0-65	1SAM201906R1103		10	0.055
65	4	0	PS1-4-0-65	1SAM201906R1104		10	0.077
65	5	0	PS1-5-0-65	1SAM201906R1105		10	0.098
65	2	1	PS1-2-1-65	1SAM201906R1112		10	0.036
65	3	1	PS1-3-1-65	1SAM201906R1113		10	0.060
65	4	1	PS1-4-1-65	1SAM201906R1114		10	0.087
65	5	1	PS1-5-1-65	1SAM201906R1115		10	0.108
65	2	2	PS1-2-2-65	1SAM201906R1122		10	0.040
65	3	2	PS1-3-2-65	1SAM201906R1123		10	0.067
65	4	2	PS1-4-2-65	1SAM201906R1124		10	0.095
65	5	2	PS1-5-2-65	1SAM201906R1125		10	0.122
100	3	0	PS1-3-0-100	1SAM201916R1103		10	0.084
100	4	0	PS1-4-0-100	1SAM201916R1104		10	0.117
100	5	0	PS1-5-0-100	1SAM201916R1105		10	0.154
100	3	1	PS1-3-1-100	1SAM201916R1113		10	0.094
100	4	1	PS1-4-1-100	1SAM201916R1114		10	0.134
100	5	1	PS1-5-1-100	1SAM201916R1115		10	0.172
100	3	2	PS1-3-2-100	1SAM201916R1123		10	0.105

Rated operational current A	Rated cross section mm²	Mounting form	Type	Order code		Pkg qty	Weight (1 pce) kg
Three-phase feeder terminals							
65	25	Flat	S1-M1-25	1SAM201907R1101		10	0.038
65	25	High	S1-M2-25	1SAM201907R1102		10	0.051
65	25	UL type E and IEC	S1-M3-25	1SAM201907R1103		10	0.042
100	35	UL type E and IEC	S1-M3-35	1SAM201913R1103		10	0.060

Description	Type	Order code		Pkg qty	Weight (1 pce) kg
Protection cover for busbars	BS1-3	1SAM201908R1001		50	0.003
Padlock	SA2	GJF1101903R0002		10	0.020
Screw fixing kit	FS116	1SAM201909R1001		1	0.020

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MS132 manual motor starters
Main accessories

1SBC101209F0014

HKF1-11

1SBC101209F0014

HK1-11

1SBC101210F0014

SK1-11

1SBC101286F0014

CK1-11

1SBC101211F0014

AA1-24

1SBC101212F0014

UA1-24

Description

MS132 manual motor starters can be equipped with auxiliary contacts for lateral/front mounting, signalling contact for lateral mounting, undervoltage release and shunt trips. Two different signalling contacts are available. The accessories can be fitted wiring free and without tools. A variety of combinations is possible as required for the application. The auxiliary contacts change position with the main contacts. The signalling contact SK signals tripping regardless if it was caused by short-circuit or overload. The signalling contact CK signals tripping in case it was caused by short-circuit. Undervoltage release are used for remote tripping of the manual motor starter especially for emergency stop circuits. Shunt trips release the MMS used for remote tripping.

Ordering details

Auxiliary contacts N.O.	Auxiliary contacts N.C.	Description	Type	Order code		Pkg qty	Weight (1 pce) kg
Auxiliary contacts – mountable on the front							
1	1		HKF1-11	1SAM201901R1001		10	0.015
Auxiliary contacts – mountable on the right							
1	1	max. 2 pieces	HK1-11	1SAM201902R1001		2	0.035
2	0	max. 2 pieces	HK1-20	1SAM201902R1002		2	0.035
0	2	max. 2 pieces	HK1-02	1SAM201902R1003		2	0.035
2	0	with lead contacts	HK1-20L	1SAM201902R1004		2	0.035
Signalling contacts – mountable on the right							
1	1	for tripped alarm, max. 2 pieces	SK1-11	1SAM201903R1001		2	0.035
2	0	for tripped alarm, max. 2 pieces	SK1-20	1SAM201903R1002		2	0.035
0	2	for tripped alarm, max. 2 pieces	SK1-02	1SAM201903R1003		2	0.035
1	1	for short-circuit alarm, max. 2 pieces	CK1-11	1SAM301901R1001		2	0.035
2	0	for short-circuit alarm, max. 2 pieces	CK1-20	1SAM301901R1002		2	0.035
0	2	for short-circuit alarm, max. 2 pieces	CK1-02	1SAM301901R1003		2	0.035

Rated control supply voltage V	Frequency Hz	Type	Order code		Pkg qty	Weight (1 pce) kg
Shunt trip units – mountable on the left						
24	50/60	AA1-24	1SAM201910R1001		1	0.100
110	50/60	AA1-110	1SAM201910R1002		1	0.100
200 ... 240	50/60	AA1-230	1SAM201910R1003		1	0.100
350 ... 415	50/60	AA1-400	1SAM201910R1004		1	0.100
Undervoltage releases – mountable on the left						
24	50	UA1-24	1SAM201904R1001		1	0.100
48	50	UA1-48	1SAM201904R1002		1	0.100
60	50	UA1-60	1SAM201904R1003		1	0.100
110 ... 120	50/60	UA1-120	1SAM201904R1004		1	0.100
208	60	UA1-208	1SAM201904R1005		1	0.100
230 ... 240	50/60	UA1-230	1SAM201904R1006		1	0.100
400	50	UA1-400	1SAM201904R1007		1	0.100
415 ... 480	50/60	UA1-415	1SAM201904R1008		1	0.100

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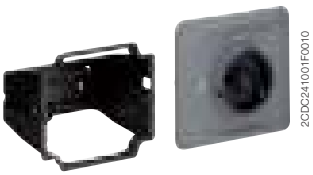
MS132 manual motor starters
Main accessories

IB132-Y

IB132-G

DMS132-Y



DMS132-G

Description

IB132 are IP65 enclosures for single MMS installation. Additional mounting of auxiliary and signalling contacts, shunt trips and undervoltage release is possible. The handle is lockable in OFF position. For detailed specification see installation instruction.

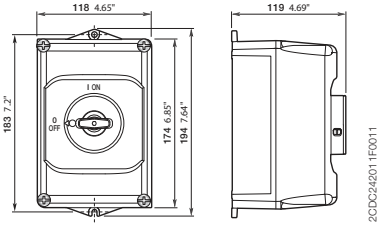
DMS132 are IP65 door mounting kits for MMS installation in any enclosure. Additional mounting of auxiliary, signalling, shunt trips and undervoltage release is possible. The handle is lockable in OFF position. For detailed specification see installation instruction.

Ordering details

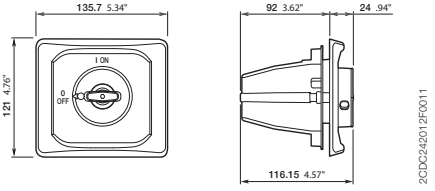
Description	Colour	Type	Order code		Pkg qty	Weight (1 pce) kg
Enclosures IP65						
Padlockable max. 3 padlocks with bail diameter 4 ... 6.5 mm	Yellow/red	IB132-Y	1SAM201911R1011		1	0.370
	Grey/black	IB132-G	1SAM201911R1010		1	0.370
Door mounting kit IP65						
Padlockable max. 3 padlocks with bail diameter 4 ... 6.5 mm	Yellow/red	DMS132-Y	1SAM201912R1011		1	0.170
	Grey/black	DMS132-G	1SAM201912R1010		1	0.170

Indication I-O-T and ON-OFF-T

Main dimensions mm, *inches*



IB132



DMS132

2CDC131040C0201_9s10

MS132 manual motor starters
Main accessories

2CDC241007F0011

MSHD-LTB

2CDC241006F0011

MSHD-LTY

2CDC241004S0011

MSMN

2CDC241005S0011

MSOX-30

Description
The complete set includes handle, shaft and driver. All accessories fit 6 mm shafts of maximum 180 mm length. The degree of protection for handles MSHD is IP64.

Ordering details

Description	Shaft length mm	Type	Order code		Pkg qty	Weight (1 pce) kg
Shafts						
For selector type handles. Shaft diameter 6 mm. Shaft extension for door coupling driver.	85	OXS6X85	1SCA101647R1001		1	0.020
	105	OXS6X105	1SCA108043R1001		1	0.020
	130	OXS6X130	1SCA101655R1001		1	0.030
	180	OXS6X180	1SCA101659R1001		1	0.040

Description	Colour	Type	Order code		Pkg qty	Weight (1 pce) kg
Selector type handles IP64						
Padlockable max. 3 padlocks with bail diameter 5 ... 8 mm, door interlock in ON position defeatable, for use with 6 mm OXS6...types up to 180 mm or driver shafts MSOX.	Black	MSHD-LTB [1]	1SAM201920R1011		1	0.065
	Yellow	MSHD-LTY [1]	1SAM201920R1012		1	0.065

[1] Indication I-O-T and ON-OFF-T

Description	Type	Order code		Pkg qty	Weight (1 pce) kg
Driver					
Coupling driver for use with 6 mm OXS6... types up to 180 mm.	MSMN [1]	1SAM101923R0002		1	0.002
	MSMNO [2]	1SAM101923R0012		1	0.002

[1] Coded - Positioning of ON indication dependent from mounting orientation of the MS
[2] Uncoded - Positioning of ON indication independent from mounting orientation of the MS

Description	Shaft length mm	Type	Order code		Pkg qty	Weight (1 pce) kg
Driver shafts						
Driver shaft - combination driver & shaft. Shaft diameter 6 mm.	32	MSOX-32 [1]	1SAM101924R0003		1	0.010
	30	MSOX-30 [2]	1SAM101924R0013		1	0.010

[1] MSOX-32 is for normal vertical use
[2] MSOX-30 is for horizontal use

2CDC131040C0201_10s10

MO132 manual motor starters magnetic only
0.10 to 32 A – with electromagnetic protection

MO132-6.3

MO132-32

Description

Manual motor starters magnetic only are electromechanical protection devices for the main circuit. They are used mainly to switch motors manually ON/OFF and protect them fuse less against short-circuit.

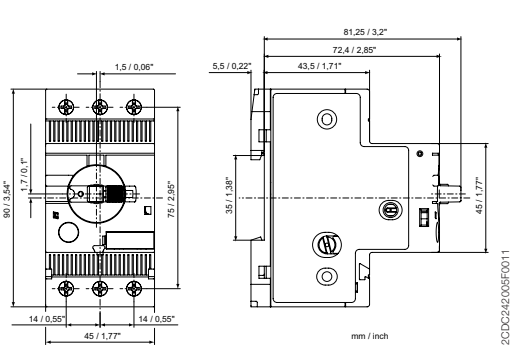
Fuse less protection with a manual motor starter saves costs, space and ensures a quick reaction under short-circuit condition, by switching off the motor within milliseconds. Fuse less starter combinations are setup together with contactors and overload relays.

Ordering details

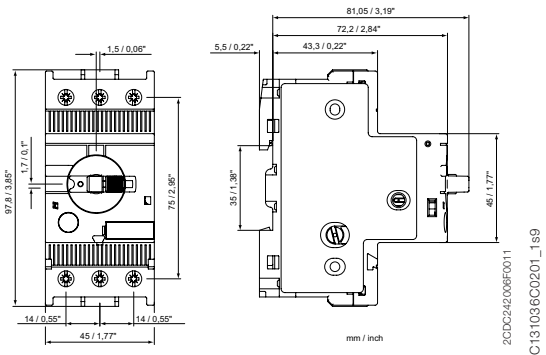
Rated operational power 400 V AC-3[1]	Rated operational current	Short-circuit breaking capacity I_{cs} at 400 V AC	Rated instantaneous short-circuit current setting I_i	Type	Order code		Weight (1 pce)
kW	A	kA	A				kg
0.03	0.16	100	1.56	MO132-0.16	1SAM360000R1001		0.215
0.06	0.25	100	2.44	MO132-0.25	1SAM360000R1002		0.215
0.09	0.40	100	3.90	MO132-0.4	1SAM360000R1003		0.215
0.12	0.63	100	6.14	MO132-0.63	1SAM360000R1004		0.215
0.25	1.0	100	11.50	MO132-1.0	1SAM360000R1005		0.215
0.55	1.6	100	18.40	MO132-1.6	1SAM360000R1006		0.265
0.75	2.5	100	28.75	MO132-2.5	1SAM360000R1007		0.265
1.5	4.0	50	50.00	MO132-4.0	1SAM360000R1008		0.265
2.2	6.3	50	78.75	MO132-6.3	1SAM360000R1009		0.265
4.0	10	50	125.00	MO132-10	1SAM360000R1010		0.265
5.5	12	50	150.00	MO132-12	1SAM360000R1012		0.310
7.5	16	50	200.00	MO132-16	1SAM360000R1011		0.310
9.0	20	50	250.00	MO132-20	1SAM360000R1013		0.310
12.5	25	50	313.00	MO132-25	1SAM360000R1014		0.310
15.5	32	25	400.00	MO132-32	1SAM360000R1015		0.310

[1] For overload protection of motors, an appropriate thermal or electronic overload relay must be used

Main dimensions mm, *inches*



MO132 ≤ 10 A



MO132 ≥ 12 A

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MO132 manual motor starters magnetic only
Technical data

Main circuit – Utilization characteristics according to IEC/EN

Type	MO132
Standards	IEC/EN 60947–2, IEC/EN 60947-4-1, IEC/EN 60947-1
Rated operational voltage U_e	690 V AC
Rated frequency	50/60 Hz
Number of poles	3
Duty time	100 %
Rated impulse withstand voltage U_{imp}	6 kV
Rated insulation voltage U_i	690 V AC
Rated operational current I_e	See ordering details
Rated instantaneous short-circuit current setting I_i	See ordering details
Rated service short-circuit breaking capacity I_{cs}	See table "Short-circuit breaking capacity and back-up fuses"
Rated ultimate short-circuit breaking capacity I_{cu}	See table "Short-circuit breaking capacity and back-up fuses"

Short-circuit breaking capacity and back-up fuses

I_{CS} Rated service short-circuit breaking capacity
I_{CU} Rated ultimate short-circuit breaking capacity
I_{CC} Prospective short-circuit current at installation location

Note: Maximum rated current of the back-up fuses if $I_{CC} > I_{CS}$

Type	230 V AC			400 V AC			440 V AC			500 V AC			690 V AC		
	I_{CS} kA	I_{CU} kA	gG, aM A	I_{CS} kA	I_{CU} kA	gG, aM A	I_{CS} kA	I_{CU} kA	gG, aM A	I_{CS} kA	I_{CU} kA	gG, aM A	I_{CS} kA	I_{CU} kA	gG, aM A
MO132-0.16	No back-up fuse required up to I_{CC} = 100 kA														
MO132-0.25															
MO132-0.4															
MO132-0.63															
MO132-1.0															
MO132-1.6															
MO132-2.5															
MO132-4.0	50	50	*	50	50	*	*	*	*	20	20	*	3	3	*
MO132-6.3	50	50	*	50	50	*	*	*	*	20	20	*	3	3	*
MO132-10	50	50	*	50	50	*	*	*	*	20	20	*	3	3	*
MO132-12	50	50	*	50	50	*	*	*	*	20	20	*	3	3	*
MO132-16	50	50	*	50	50	*	*	*	*	20	20	*	3	3	*
MO132-20	50	50	*	50	50	*	*	*	*	20	20	*	3	3	*
MO132-25	50	50	*	50	50	*	*	*	*	10	10	*	3	3	*
MO132-32	25	50	*	25	50	*	*	*	*	10	10	*	3	3	*

*not available yet

General technical data

Type			MO132
Pollution degree			3
Phase loss sensitive			Yes
Ambient air temperature	Operation	Open	-25 ... +60 °C
	Storage		-50 ... +80 °C
Ambient air temperature compensation			Continuous
Maximum operating altitude permissible			2000 m
Resistance to shock acc. to IEC 60068-2-27			25 g / 11 ms
Resistance to vibrations acc. to IEC 60068-2-6			5 g / 3 ... 150 Hz
Mounting position			Position 1-6 (optional for single mounting)
Mounting			DIN-rail (EN 60715)
Group mounting			On request
Minimum distance to other units same type		Horizontal	0 mm
		Vertical	150 mm
Minimum distance to electrical conductive board		Horizontal, up to 400 V	0 mm
		Horizontal, up to 690 V	> 1.5 mm
		Vertical	75 mm
Degree of protection		Enclosure / terminals	IP20

Connecting characteristics

Main circuit

Type				MO132-0.16 ... MO132-10	MO132-12 ... MO132-16	MO132-20 ... MO132-32
Connecting capacity		Solid	**1 or 2 x**	1 ... 4 mm²	1 ... 4 mm²	2.5 ... 6 mm²
		Flexible	**1 or 2 x**	0.75 ... 2.5 mm²	0.75 ... 2.5 mm²	1 ... 6 mm²
		Stranded acc. to UL/CSA	**1 or 2 x**	AWG 16-12	AWG 16-12	AWG 12-8
		Flexible acc. to UL/CSA	**1 or 2 x**	AWG 16-12	AWG 16-12	AWG 12-8
Stripping length				9 mm	10 mm	10 mm
Tightening torques				0.8 ... 1.2 Nm / 10 ... 12 lb.in	1.5 Nm / 14 lb.in	2.0 Nm / 18 lb.in
Connection screw				M3.5 (Pozidriv 2)	M4 (Pozidriv 2)	M4 (Pozidriv 2)

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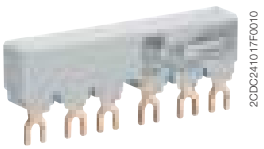
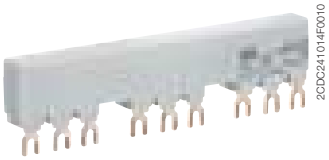
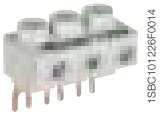
MO132 manual motor starters magnetic only
Main accessories



PS1-2-0-65



PS1-3-1-100



S1-M1-25

S1-M2-25

SA1

Description

Three-phase busbars ensure a quick and safe connection and are therefore a cost effective solution. A variety of different three-phase busbars up to 100 A are in the assortment. Between 2 and 5 manual motor starters with none, one or two lateral auxiliary contacts can be connected. Different three-phase feeder terminals are available according to the application.

Ordering details

Rated operational current A	Number of MMS	Number of lateral aux.	Type	Order code		Pkg qty	Weight (1 pce) kg
Three-phase busbars							
65	2	0	PS1-2-0-65	1SAM201906R1102		10	0.034
65	3	0	PS1-3-0-65	1SAM201906R1103		10	0.055
65	4	0	PS1-4-0-65	1SAM201906R1104		10	0.077
65	5	0	PS1-5-0-65	1SAM201906R1105		10	0.098
65	2	1	PS1-2-1-65	1SAM201906R1112		10	0.036
65	3	1	PS1-3-1-65	1SAM201906R1113		10	0.060
65	4	1	PS1-4-1-65	1SAM201906R1114		10	0.087
65	5	1	PS1-5-1-65	1SAM201906R1115		10	0.108
65	2	2	PS1-2-2-65	1SAM201906R1122		10	0.040
65	3	2	PS1-3-2-65	1SAM201906R1123		10	0.067
65	4	2	PS1-4-2-65	1SAM201906R1124		10	0.095
65	5	2	PS1-5-2-65	1SAM201906R1125		10	0.122
100	3	0	PS1-3-0-100	1SAM201916R1103		10	0.084
100	4	0	PS1-4-0-100	1SAM201916R1104		10	0.117
100	5	0	PS1-5-0-100	1SAM201916R1105		10	0.154
100	3	1	PS1-3-1-100	1SAM201916R1113		10	0.094
100	4	1	PS1-4-1-100	1SAM201916R1114		10	0.134
100	5	1	PS1-5-1-100	1SAM201916R1115		10	0.172
100	3	2	PS1-3-2-100	1SAM201916R1123		10	0.105

Rated operational current A	Rated cross section mm²	Mounting form	Type	Order code		Pkg qty	Weight (1 pce) kg
Three-phase feeder terminals							
65	25	Flat	S1-M1-25	1SAM201907R1101		10	0.038
65	25	High	S1-M2-25	1SAM201907R1102		10	0.051
65	25	UL type E and IEC	S1-M3-25	1SAM201907R1103		10	0.042
100	35	UL type E and IEC	S1-M3-35	1SAM201913R1103		10	0.060

Description	Type	Order code		Pkg qty	Weight (1 pce) kg
Protection cover for busbars	BS1-3	1SAM201908R1001		50	0.003
Padlock + two keys	SA2	GJF1101903R0002		10	0.020
Screw fixing kit	FS116	1SAM201909R1001		1	0.020

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MO132 manual motor starters magnetic only
Main accessories

1SBC101208F0014

HKF1-11

1SBC101209F0014

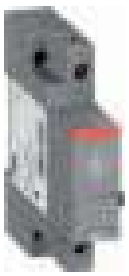
HK1-11

1SBC101210F0014

SK1-11

1SBC101211F0014

AA1-24


1SBC101212F0014

UA1-24

Description

MO132 manual motor starters can be equipped with auxiliary contacts for lateral/front mounting, signalling contact for lateral mounting, undervoltage release and shunt trips. The accessories can be fitted wiring free and without tools. A variety of combinations is possible as required for the application. The auxiliary contacts change position with the main contacts. Undervoltage release are used for remote tripping of the manual motor starter especially for emergency stop circuits. Shunt trips release the MMS used for remote tripping.

Ordering details

Auxiliary contacts N.O.	Auxiliary contacts N.C.	Description	Type	Order code		Pkg qty	Weight (1 pce) kg
Auxiliary contacts – mountable on the front							
1	1		HKF1-11	1SAM201901R1001		10	0.015
Auxiliary contacts – mountable on the right							
1	1	Max. 2 pieces	HK1-11	1SAM201902R1001		2	0.035
2	0	Max. 2 pieces	HK1-20	1SAM201902R1002		2	0.035
0	2	Max. 2 pieces	HK1-02	1SAM201902R1003		2	0.035
2	0	With lead contacts	HK1-20L	1SAM201902R1004		2	0.035
Signalling contacts – mountable on the right							
1	1	For tripped alarm, max. 2 pieces	SK1-11	1SAM201903R1001		2	0.035
2	0	For tripped alarm, max. 2 pieces	SK1-20	1SAM201903R1002		2	0.035
0	2	For tripped alarm, max. 2 pieces	SK1-02	1SAM201903R1003		2	0.035

Rated control supply voltage V	Frequency Hz	Type	Order code		Pkg qty	Weight (1 pce) kg
Shunt trip units – mountable on the left						
24	50/60	AA1-24	1SAM201910R1001		1	0.100
110	50/60	AA1-110	1SAM201910R1002		1	0.100
200 ... 240	50/60	AA1-230	1SAM201910R1003		1	0.100
350 ... 415	50/60	AA1-400	1SAM201910R1004		1	0.100
Undervoltage releases – mountable on the left						
24	50	UA1-24	1SAM201904R1001		1	0.100
48	50	UA1-48	1SAM201904R1002		1	0.100
60	50	UA1-60	1SAM201904R1003		1	0.100
110 ... 120	50/60	UA1-120	1SAM201904R1004		1	0.100
208	60	UA1-208	1SAM201904R1005		1	0.100
230 ... 240	50/60	UA1-230	1SAM201904R1006		1	0.100
400	50	UA1-400	1SAM201904R1007		1	0.100
415 ... 480	50/60	UA1-415	1SAM201904R1008		1	0.100

2CDC131036C0201_5s9

MO132 manual motor starters magnetic only
Main accessories

IB132-Y

IB132-G

DMS132-Y

DMS132-G

Description

IB132 are IP65 enclosures for single MMS installation. Additional mounting of auxiliary and signalling contacts, shunt trips and undervoltage release is possible. The handle is lockable in OFF position. For detailed specification see installation instruction.

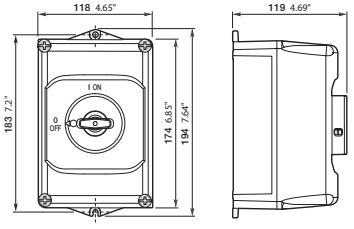
DMS132 are IP65 door mounting kits for MMS installation in any enclosure. Additional mounting of auxiliary, signalling, shunt trips and undervoltage release is possible. The handle is lockable in OFF position. For detailed specification see installation instruction.

Ordering details

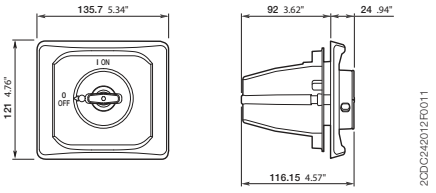
Description	Color	Type	Order code		Pkg qty	Weight (1 pce) kg
Enclosures IP65						
Padlockable max. 3 padlocks with bail diameter 4 ... 6.5 mm	Yellow/red	IB132-Y	1SAM201911R1011		1	0.370
	Grey/black	IB132-G	1SAM201911R1010		1	0.370
Door mounting kit IP65						
Padlockable max. 3 padlocks with bail diameter 4 ... 6.5 mm	Yellow/red	DMS132-Y	1SAM201912R1011		1	0.170
	Grey/black	DMS132-G	1SAM201912R1010		1	0.170

Indication I-O-T and ON-OFF-T

Main dimensions mm, *inches*



IB132



DMS132

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MO132 manual motor starters magnetic only
Main accessories

MSHD-LTB

MSHD-LTY

MSMN

MSOX-30

Description

The complete set includes handle, shaft and driver. All accessories fit 6 mm shafts of maximum 180 mm length. The degree of protection for handles MSHD is IP64.

Ordering details

Description	Shaft length mm	Type	Order code		Pkg qty	Weight (1 pce) kg
Shafts						
For selector type handles. Shaft diameter 6 mm. Shaft extension for door coupling driver.	85	OXS6X85	1SCA101647R1001		1	0.020
	105	OXS6X105	1SCA108043R1001		1	0.020
	130	OXS6X130	1SCA101655R1001		1	0.030
	180	OXS6X180	1SCA101659R1001		1	0.040

Description	Color	Type	Order code		Pkg qty	Weight (1 pce) kg
Selector type handles IP64						
Padlockable max. 3 padlocks with bail diameter 5 ... 8 mm, door interlock in ON position defeatable, for use with 6 mm OXS6...types up to 180 mm or driver shafts MSOX.	Black	MSHD-LTB [1]	1SAM201920R1011		1	0.065
	Yellow	MSHD-LTY [1]	1SAM201920R1012		1	0.065

[1] Indication I-O-T and ON-OFF-T

Description	Type	Order code		Pkg qty	Weight (1 pce) kg
Driver					
Coupling driver for use with 6 mm OXS6... types up to 180 mm.	MSMN [1]	1SAM101923R0002		1	0.002
	MSMNO [2]	1SAM101923R0012		1	0.002

[1] Coded - Positioning of ON indication dependent from mounting orientation of the MS
[2] Uncoded - Positioning of ON indication independent from mounting orientation of the MS

Description	Shaft length mm	Type	Order code		Pkg qty	Weight (1 pce) kg
Driver shafts						
Driver shaft - combination driver & shaft. Shaft diameter 6 mm.	32	MSOX-32 [1]	1SAM101924R0003		1	0.010
	30	MSOX-30 [2]	1SAM101924R0013		1	0.010

[1] MSOX-32 is for normal vertical use
[2] MSOX-30 is for horizontal use

2CDC131036C0201_9s9

MS450, MS495, MS497 manual motor starters
22 to 100 A – with thermal and electromagnetic protection

2CDC241004F0009

MS450-40

1SBC101184F0014

MS495-40

2CDC241020F0011

MS497-100

Description

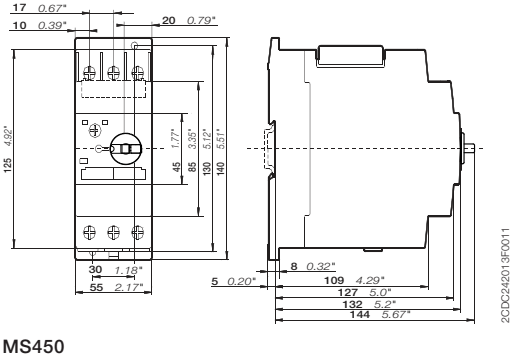
Manual motor starters (MMS) are protection devices for the main circuit. They combine motor control and protection in a single device. MMS are used mainly to switch motors manually ON/OFF and protect them and the installation fuse less against short-circuit, overload and phase failures. Fuse less protection with a manual motor starter saves costs, space and ensures a quick reaction under short-circuit condition, by switching off the motor within milliseconds.

Further features are the build-in disconnect function, temperature compensation, trip-free mechanism and a rotary handle with a clear switch position indication. The manual motor starter is suitable for three- and single-phase applications. The handle is lockable to protect against unauthorized changes. Auxiliary contacts, signalling contacts, undervoltage releases, shunt trips, three-phase busbars, power in-feed blocks are available as accessory.

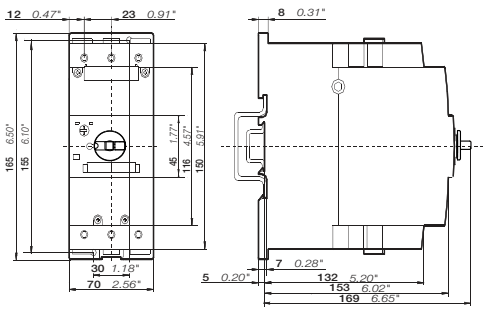
Ordering details

Rated operational power 400 V AC-3	Setting range	Short-circuit breaking capacity I_{cs} at 400 V AC	Rated instantaneous short-circuit current setting I_i	Type	Order code		Weight (1 pce)
kW	A	kA	A				kg
MS450 manual motor starter							
15.8	28.0 ... 40.0	25	520.00	MS450-40	1SAM450000R1005		1.047
22	36.0 ... 45.0	25	585.00	MS450-45	1SAM450000R1006		1.039
22	40.0 ... 50.0	25	650.00	MS450-50	1SAM450000R1007		1.027
MS495 manual motor starter							
30	45.0 ... 63.0	25	819.00	MS495-63	1SAM550000R1007		2.247
37	57.0 ... 75.0	25	975.00	MS495-75	1SAM550000R1008		2.253
45	70.0 ... 90.0	25	1170.00	MS495-90	1SAM550000R1009		2.280
55	80.0 ... 100.0	25	1235.00	MS495-100	1SAM550000R1010		2.295
MS497 manual motor starter							
15	22.0 ... 32.0	50	416.00	MS497-32	1SAM580000R1004		2.222
18.5	28.0 ... 40.0	50	520.00	MS497-40	1SAM580000R1005		2.203
22	36.0 ... 50.0	50	650.00	MS497-50	1SAM580000R1006		2.230
30	45.0 ... 63.0	50	819.00	MS497-63	1SAM580000R1007		2.255
37	57.0 ... 75.0	50	975.00	MS497-75	1SAM580000R1008		2.266
45	70.0 ... 90.0	50	1170.00	MS497-90	1SAM580000R1009		2.268
55	80.0 ... 100.0	50	1235.00	MS497-100	1SAM580000R1010		2.275

Main dimensions mm, *inches*



MS450



MS495, MS497

2CDC131042C0201

MS450, MS495, MS497 manual motor starters
Technical data

Main circuit – Utilization characteristics according to IEC/EN

Type	MS450, MS495, MS497
Standards	IEC/EN 60947–2, IEC/EN 60947-4-1, IEC/EN 60947-1
Rated operational voltage U_e	690 V AC / 450 V DC
Rated frequency	50/60 Hz
Trip class	10
Number of poles	3
Duty time	100 %
Rated impulse withstand voltage U_{imp}	6 kV
Rated insulation voltage U_i	690 V AC
Rated operational current I_e	See ordering details
Rated instantaneous short-circuit current setting I_i	See ordering details
Rated service short-circuit breaking capacity I_{cs}	See table "Short-circuit breaking capacity and back-up fuses"
Rated ultimate short-circuit breaking capacity I_{cu}	See table "Short-circuit breaking capacity and back-up fuses"

Short-circuit breaking capacity and back-up fuses

I_{cs} Rated service short-circuit breaking capacity

I_{cu} Rated ultimate short-circuit breaking capacity

I_{cc} Prospective short-circuit current at installation location

Note: Maximum rated current of the back-up fuses if $I_{cc} > I_{cs}$

Type	240 V AC			400 V AC			440 V AC			500 V AC			690 V AC		
	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A
Short-circuit protection MS450															
MS450-40	No back-up fuse required up to I_{cc} = 100 kA			25	50	160	15	50	125	5	10	100	2	4	63
MS450-45				25	50	160	15	50	125	5	10	100	2	4	63
MS450-50				25	50	160	15	50	125	5	10	100	2	4	80

MS450: No need for back-up fuse in networks with a prospective current of up to 50 kA at 400 V.
With an approbiate 160 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA.

Short-circuit protection MS495															
MS495-40	No back-up fuse required up to I_{cc} = 100 kA			25	50	125	20	50	125	6	12	125	3	6	63
MS495-50				25	50	125	20	50	125	6	12	125	3	6	80
MS495-63				25	50	160	20	50	160	6	12	160	3	6	80
MS495-75				25	50	160	20	50	160	6	8	160	3	5	100
MS495-90				25	50	160	20	50	160	6	8	160	3	5	125
MS495-100				25	50	160	20	50	160	6	8	160	3	5	125

MS495-40: No need for back-up fuse in networks with a prospective current of up to 50 kA at 400 V.
With an approbiate 125 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA.
MS495-100: No need for back-up fuse in networks with a prospective current of up to 50 kA at 400 V.
With an approbiate 160 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA.

Short-circuit protection MS497															
MS497-32	No back-up fuse required up to I_{cc} = 100 kA			No back-up fuse required up to I_{cc} = 100 kA											
MS497-40															
MS497-50															
MS497-63															
MS497-75															
MS497-90															
MS497-100															
	50	100		50	100	No back-up fuse required up to I_{cc} = 100 kA	11	22	100	7	12	63			
	50	100		50	100		9	18	160	6	12	80			
	50	100		50	100		7.5	15	160	5	10	100			
	50	100		50	70	200	7.5	15	160	4	7.5	100			
	50	100		50	70	200	5	10	160	3	6	125			
	50	100		50	70	200	5	10	160	3	6	160			
	50	100		50	70	200	5	10	160	3	6	160			

MS497-32: No need for back-up fuse in networks with a prospective current of up to 100 kA at 440 V.
MS497-90: No need for back-up fuse in networks with a prospective current of up to 70 kA at 440 V.
With an approbiate 200 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA.

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MS450, MS495, MS497 manual motor starters
Technical data

General technical data

Type		MS450	MS495	MS497
Pollution degree		3		
Phase loss sensitive		Yes		
Ambient air temperature				
Operation	Open - compensated without derating	-20 ... +60 °C		
	Open	-20 ... +70 °C		
	Enclosed	-20 ... +35 °C		
Storage		-50 ... +80 °C		
Ambient air temperature compensation		Continuous		
Maximum operating altitude permissible		2000 m		
Resistance to shock acc. to IEC 60068-2-27		25 g / 11 ms	-	
Resistance to vibrations acc. to IEC 60068-2-6		2 g / 5-150 Hz		
Mounting position		Position 1-6 (optional for single mounting)		
Mounting		DIN-rail 35 mm (EN 60715)	DIN-rail 15 mm / 75 mm (EN 60715)	
Minimum distance to other units same type	Horizontal	0 mm	0 mm	
	Vertical - up to 240 V	-	50 mm	
	Vertical - up to 440 V	-	70 mm	
	Vertical - up to 500 V	-	110 mm	
	Vertical - up to 690 V	-	150 mm	
	Vertical	50 mm	-	
Minimum distance to electrical conductive board	Horizontal	10 mm	-	
	Horizontal - up to 500 V	-	10 mm	
	Horizontal - up to 690 V	-	30 mm	
	Vertical - up to 240 V	-	50 mm	
	Vertical - up to 440 V	-	70 mm	
	Vertical - up to 500 V	-	110 mm	
	Vertical - up to 690 V	-	150 mm	
	Vertical	50 mm	-	
Degree of protection	Enclosure / terminals	IP20		

Connecting characteristics

Main circuit

Type			MS450	MS495	MS497
Connecting capacity					
	Solid	**1 or 2 x**	0.75 ... 16 mm²	2.5 ... 16 mm²	2.5 ... 16 mm²
	Flexible	**1 x**	0.75 ... 35 mm²	10 ... 70 mm²	10 ... 70 mm²
		2 x	0.75 ... 25 mm²	10 ... 50 mm²	10 ... 50 mm²
	Stranded acc. to UL/CSA	**1 x**	AWG 18-2	AWG 10-2/0	AWG 10-2/0
		2 x	AWG 18-2	AWG 10-1/0	AWG 10-1/0
	Flexible acc. to UL/CSA	**1 x**	AWG 18-2	AWG 10-2/0	AWG 10-2/0
		2 x	AWG 18-2	AWG 10-1/0	AWG 10-1/0
Stripping length			13 mm	17 mm	17 mm
Tightening torques			3 - 4.5 Nm / 27 ... 40 lb.in	4 - 6 Nm / 35 - 53 lb.in	4 - 6 Nm / 35 - 53 lb.in
Connection screw			Pozidriv 2	Hexagon 4	Hexagon 4

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MS450, MS495, MS497 manual motor starters
Main accessories

SA2

Description
Three-phase busbars ensure a quick and safe connection and are therefor a cost effective solution. A variety of different three-phase busbars up to 108A are in the assortment. Between 2 and 4 manual motor starter with none or two lateral auxiliary contacts can be connected.

Ordering details

Rated operational current A	Number of MMS	Number of lateral aux.	Type	Order code		Pkg qty	Weight (1 pce) kg
Three-phase busbars for MS450 only							
108	2	0	PS4-2-0	1SAM401911R1001		5	0.134
108	3	0	PS4-3-0	1SAM401911R1002		5	0.206
108	4	0	PS4-4-0	1SAM401911R1003		5	0.280
108	2	1	PS4-2-2	1SAM401911R1004		5	0.148
108	3	1	PS4-3-2	1SAM401911R1005		5	0.250
108	4	1	PS4-4-2	1SAM401911R1006		5	0.362

Rated operational current A	Rated cross section mm²	Mounting form	Type	Order code		Pkg qty	Weight (1 pce) kg
Three-phase feeder terminals for MS450 only							
108	25	Flat	S4-M1	1SAM401911R1007		2	0.106

Description	For MMS	Type	Order code		Pkg qty	Weight (1 pce) kg
Protection cover for busbar	PS4	BS4-3	1SAM401911R1008		10	0.001
Disconnector module	MS450	TB450	1SAM401910R1001		1	0.315
Terminal shroud	MS450	KA450	1SAM401908R1001		1	0.154
Terminal shroud	MS495	KA495	1SAM501901R1001		10	0.018
Terminal shroud	MS495	KA495C [1)]	1SAM501902R1001		10	0.038
Terminal insulation barrier for UL508E	MS495	DX495	1SAM401912R1001		1	0.154
Padlock + 2 keys	MS450, MS495, MS497	SA2	GJF1101903R0002		10	0.020

[1)] Is plugged onto the housing after removing the box terminals, if using cable lugs.

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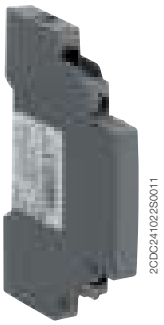
MS450, MS495, MS497 manual motor starters
Main accessories

HK4-11



HKS4-20

SK4-11

AA4-24

Description

MS450, MS495, MS497 manual motor starters can be equipped with auxiliary contacts for lateral/front mounting, signalling contact for lateral mounting, undervoltage release and shunt trips. The accessories can be fitted wiring free and without tools. A variety of combinations is possible as required for the application. The auxiliary contacts change position with the main contacts. Undervoltage release are used for remote tripping of the manual motor starter especially for emergency stop circuits. Shunt trips release the MMS used for remote tripping.

Ordering details

Auxiliary contacts N.O.	Auxiliary contacts N.C.	Description	Type	Order code		Pkg qty	Weight (1 pce) kg
Auxiliary contacts – mountable on the front							
1	1		HK4-11	1SAM401901R1001		10	0.017
		Changeover	HK4-W	1SAM401901R1002		10	0.015
Auxiliary contacts – mountable on the left							
1	1	Max. 1 pieces	HKS4-11	1SAM401902R1001		2	0.045
2	0	Max. 1 pieces	HKS4-20	1SAM401902R1002		2	0.045
0	2	Max. 1 pieces	HKS4-02	1SAM401902R1003		2	0.045
Signalling contacts – mountable on the right							
2	2	Separate signalling acc. UL508E 1 N.O. + 1 N.C. for short circuit and 1NO+NC for general tripping , max. 2 pieces	SK4-11	1SAM401904R1001		1	0.093

Rated control supply voltage V	Frequency Hz	Type	Order code		Pkg qty	Weight (1 pce) kg
Shunt trip units – mountable on the left						
20 ... 24	50/60	AA4-24	1SAM401907R1001		1	0.135
90 ... 110	50/60	AA4-110	1SAM401907R1002		1	0.135
200 ... 240	50/60	AA4-230	1SAM401907R1003		1	0.128
350 ... 415	50/60	AA4-400	1SAM401907R1004		1	0.125
Undervoltage releases – mountable on the left						
24	50/60	UA4-24	1SAM401905R1004		1	0.134
110/120	50/60	UA4-110	1SAM401905R1001		1	0.134
230/240	50/60	UA4-230	1SAM401905R1002		1	0.131
400/440	50/60	UA4-400	1SAM401905R1003		1	0.129
230/240	50/60	UA4-HK-230	1SAM401906R1001		1	0.140
400/440	50/60	UA4-HK-400	1SAM401906R1002		1	0.137

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MS450, MS495, MS497 manual motor starters
Main accessories

General technical data

Type		PS4-xxx	S4-M1
Standards		IEC/EN 60947-1	
Rated operational voltage U_e		690 V AC	
Rated operational current I_e		108 A	
Rated frequency		50/60 Hz	
Rated impulse withstand voltage U_{imp}		6 kV	
Rated insulation voltage U_i		690 V AC	
Pollution degree		3	
Cross-section		10 mm²	25 mm²
Ambient air temperature	Operation	-25 ... +70 °C	
	Storage	-50 ... +80 °C	

Electrical connection

Main circuit

Type			S4-M1
Connecting capacity			
	Solid	1 x	2.5 ... 50 mm²
	Flexible	1 x	4 ... 16 mm²
	Stranded acc. to UL/CSA	1 x	AWG 14-4
	Flexible acc. to UL/CSA	1 x	AWG 14-4
Tightening torques			4 Nm
Connection screw			Pozidriv 2

2CDC131042C0201

MS450, MS495, MS497 manual motor starters
Main accessories

General technical data

Type		HK4-11	HK4-W	HKS4	SK4
Standards		IEC/EN 60947–1, IEC/EN 60947-5-1, UL 508, CSA22.2 No. 14			
Rated operational voltage U_e		230 V AC / 220 V DC	690 V AC / 220 V DC	690 V AC	690 V AC
Conventional free-air thermal current I_{th}		2.5 A	5 A	10 A	10 A
Rated frequency		DC, 50/60 Hz			
Rated impulse withstand voltage U_{imp}		6 kV			
Rated insulation voltage U_i		300 V	300 V	690 V	690 V
Pollution degree		3			
Ambient air temperature	Operation	-20 ... +70 °C			
	Storage	-50 ... +80 °C			
Resistance to shock acc. to IEC 60068-2-27		25 g / 11 ms			
Resistance to vibrations acc. to IEC 60068-2-6		2 g / 5 ... 150Hz			
Number of poles		1 N.C. + 1 N.O.	Changeover	1 N.C. + 1 N.O. / 2 N.O. / 2 N.C.	2 N.C. + 2 N.O.
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category					
	24 V, 50/60 Hz	2 A	4 A	6 A	6 A
	230 V, 50/60 Hz	0.5 A	3 A	4 A	4 A
	400 V, 50/60 Hz	-	1.5 A	3 A	3 A
	690 V, 50/60 Hz	-	0.5 A	1 A	1 A
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category					
	24 V	1 A	1 A	2 A	2 A
	48 V	0.3 A	-	-	-
	60 V	0.15 A	-	-	-
	110 V	-	0.22 A	0.5 A	0.5 A
	230 V	-	0.1 A	0.25 A	0.25 A
Minimum switching capacity		17 V / 1 mA		-	-
Short-circuit protective device		10 A Type gG			
Duty time		100 %			
Mounting		Front of MMS	Front of MMS	Left side of MMS	Left side of MMS
Mounting positions		1-6			
Mechanical durability		100000 cycles			
Electrical durability		100000 cycles			

Electrical connection

Main circuit

Type			HK4-11	HK4-W	HKS4	SK4
Connecting capacity						
	Solid	**1 x**	0.5... 2.5 mm²			
		2 x	0.5 ... 1.5 mm² or 0.75 ... 2.5 mm			
	Flexible	**1 x**	0.5 ... 2.5 mm²			
		2 x	0.5 ... 1.5 mm² or 0.75 ... 2.5 mm			
	Stranded acc. to UL/CSA	**1 or 2 x**	AWG 18-14			
	Flexible acc. to UL/CSA	**1 or 2 x**	AWG 18-14			
Stripping length			10 mm			
Tightening torques			0.8 ... 1.2 Nm / 7 ... 10.3 lb.in			
Connection screw			Pozidriv 2			

2CDC131042C0201

MS450, MS495, MS497 manual motor starters
Main accessories

2CDC241007F0011

MSHD-LTB

2CDC241006F0011

MSHD-LTY

2CDC241004F0011

MSMN

2CDC241005F0011

MSOX-30

Description
The complete set includes handle, shaft and driver. All accessories fit 6 mm shafts of maximum 180 mm length. The degree of protection for handles MSHD is IP64.

Ordering details

Description	Shaft length mm	Type	Order code		Pkg qty	Weight (1 pce) kg
Shafts						
For selector type handles. Shaft diameter 6 mm. Shaft extension for door coupling driver.	85	OXS6X85	1SCA101647R1001		1	0.020
	105	OXS6X105	1SCA108043R1001		1	0.020
	130	OXS6X130	1SCA101655R1001		1	0.030
	180	OXS6X180	1SCA101659R1001		1	0.040

Description	Color	Type	Order code		Pkg qty	Weight (1 pce) kg
Selector type handles IP64						
Padlockable max. 3 padlocks with bail diameter 5 ... 8 mm, door interlock in ON position defeatable, for use with 6 mm OXS6...types up to 180 mm or driver shafts MSOX.	Black	MSHD-LTB [1]	1SAM201920R1011		1	0.065
	Yellow	MSHD-LTY [1]	1SAM201920R1012		1	0.065

[1] Indication I-O-T and ON-OFF-T

Description	Type	Order code		Pkg qty	Weight (1 pce) kg
Driver					
Coupling driver for use with 6 mm OXS6... types up to 180 mm.	MSMN [1]	1SAM101923R0002		1	0.002
	MSMNO [2]	1SAM101923R0012		1	0.002

[1] Coded - Positioning of ON indication dependent from mounting orientation of the MS
[2] Uncoded - Positioning of ON indication independent from mounting orientation of the MS

Description	Shaft length mm	Type	Order code		Pkg qty	Weight (1 pce) kg
Driver shafts						
Driver shaft - combination driver & shaft. Shaft diameter 6 mm.	32	MSOX-32 [1]	1SAM101924R0003		1	0.010
	30	MSOX-30 [2]	1SAM101924R0013		1	0.010

[1] MSOX-32 is for normal vertical use
[2] MSOX-30 is for horizontal use

2CDC131042C0201

MO450, MO495, MO496 manual motor starters magnetic only
16 to 100 A – with electromagnetic protection

MO450-40

MO495-75

MO496-100

Description

The manual motor starter magnetic only is used to manually switch on and off motors and to protect them reliably and without the need for a fuse from short-circuits.

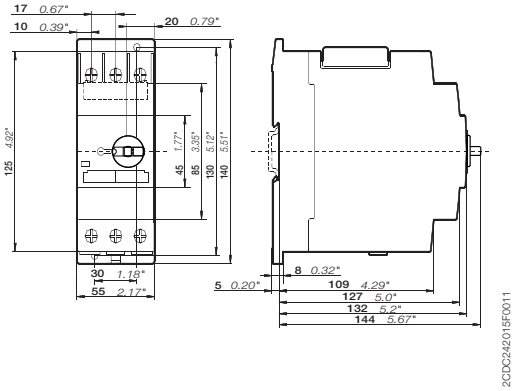
Further features are the build-in disconnect function, trip-free mechanism and a rotary handle with a clear switch position indication. The manual motor starter magnetic only is suitable for three- and single-phase applications. The handle is lockable to protect against unauthorized changes. Auxiliary contacts, signalling contacts, undervoltage releases, shunt trips, three-phase busbars, power in-feed blocks are available as accessory.

Ordering details

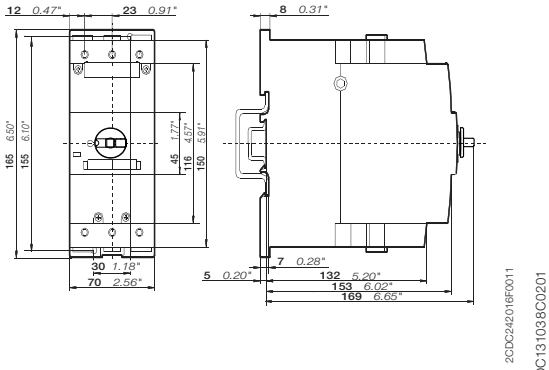
Rated operational power 400 V AC-3[1]	Rated operational current	Short-circuit breaking capacity I_{cs} at 400 V AC	Rated instantaneous short-circuit current setting I_i	Type	Order code		Weight (1 pce)
kW	A	kA	A				kg
MO450 manual motor starter							
15.8	40	25	520.00	MO450-40	1SAM460000R1005		1.033
22	45	25	585.00	MO450-45	1SAM460000R1006		1.040
22	50	25	650.00	MO450-50	1SAM460000R1007		1.019
MO495 manual motor starter							
30	63	25	819.00	MO495-63	1SAM560000R1007		2.244
37	75	25	975.00	MO495-75	1SAM560000R1008		2.247
45	90	25	1170.00	MO495-90	1SAM560000R1009		2.269
55	100	25	1235.00	MO495-100	1SAM560000R1010		2.292
MO496 manual motor starter							
7.5	16	50	208.00	MO496-16	1SAM590000R1001		2.175
9.0	20	50	260.00	MO496-20	1SAM590000R1002		2.188
12.5	25	50	325.00	MO496-25	1SAM590000R1003		2.219
15	32	50	416.00	MO496-32	1SAM590000R1004		2.208
18.5	40	50	520.00	MO496-40	1SAM590000R1005		2.218
22	50	50	650.00	MO496-50	1SAM590000R1006		2.218
30	63	50	819.00	MO496-63	1SAM590000R1007		2.248
37	75	50	975.00	MO496-75	1SAM590000R1008		2.278
45	90	50	1170.00	MO496-90	1SAM590000R1009		2.266
55	100	50	1235.00	MO496-100	1SAM590000R1010		2.293

[1] For overload protection of motors, an appropriate thermal or electronic overload relay must be used

Main dimensions mm, *inches*



MO450



MO495, MO496

2CDC131038C0201

MO450, MO495, MO496 manual motor starters magnetic only
Technical data

Main circuit – Utilization characteristics according to IEC/EN

Type	MO450, MO495, MO496
Standards	IEC/EN 60947–2, IEC/EN 60947-4-1, IEC/EN 60947-1
Rated operational voltage U_e	690 V AC / 450 V DC
Rated frequency	50/60 Hz
Number of poles	3
Duty time	100 %
Rated impulse withstand voltage U_{imp}	6 kV
Rated insulation voltage U_i	690 V AC
Rated operational current I_e	See ordering details
Rated instantaneous short-circuit current setting I_i	See ordering details
Rated service short-circuit breaking capacity I_{cs}	See table "Short-circuit breaking capacity and back-up fuses"
Rated ultimate short-circuit breaking capacity I_{cu}	See table "Short-circuit breaking capacity and back-up fuses"

Short-circuit breaking capacity and back-up fuses

I_{cs} Rated service short-circuit breaking capacity

I_{cu} Rated ultimate short-circuit breaking capacity

I_{cc} Prospective short-circuit current at installation location

Note: Maximum rated current of the back-up fuses if $I_{cc} > I_{cs}$

Type	240 V AC			400 V AC			440 V AC			500 V AC			690 V AC		
	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A
Short-circuit protection MO450															
MO450-40	No back-up fuse required up to I_{cc} = 100 kA			25	50	160	15	50	125	5	10	100	2	4	63
MO450-45				25	50	160	15	50	125	5	10	100	2	4	63
MO450-50				25	50	160	15	50	125	5	10	100	2	4	80

MO450: No need for back-up fuse in networks with a prospective current of up to 50 kA at 400 V.
With an approbiate 160 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA.

Short-circuit protection MO495															
MO495-63				25	50	160	20	50	160	6	12	160	3	6	80
MO495-75				25	50	160	20	50	160	6	8	160	3	5	100
MO495-90				25	50	160	20	50	160	6	8	160	3	5	125
MO495-100				25	50	160	20	50	160	6	8	160	3	5	125

MO495-100: No need for back-up fuse in networks with a prospective current of up to 50 kA at 400 V.
With an approbiate 160 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA.

Short-circuit protection MO496															
MO496-16	No back-up fuse required up to I_{cc} = 100 kA			No back-up fuse required up to I_{cc} = 100 kA			50	100	No back-up fuse required up to I_{cc} = 100 kA	11	22	100	7	12	63
MO496-20		50	100				50	100		11	22	100	7	12	63
MO496-25		50	100				50	100		11	22	100	7	12	63
MO496-32		50	100				50	100		11	22	100	7	12	63
MO496-40		50	100				50	100		9	18	160	6	12	80
MO496-50		50	100				50	100		7.5	15	160	5	10	100
MO496-63		50	100				50	70	200	7.5	15	160	4	7.5	100
MO496-75		50	100				50	70	200	5	10	160	3	6	125
MO496-90		50	100				50	70	200	5	10	160	3	6	160
MO496-100		50	100				50	70	200	5	10	160	3	6	160

MO496-32: No need for back-up fuse in networks with a prospective current of up to 100 kA at 440 V.
MO496-90: No need for back-up fuse in networks with a prospective current of up to 70 kA at 440 V.
With an approbiate 200 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA.

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MO450, MO495, MO496 manual motor starters magnetic only
Technical data

General technical data

Type		MO450	MO495	MO496
Pollution degree		3		
Phase loss sensitive		Yes		
Ambient air temperature				
Operation	Open - compensated without derating	-20 ... +60 °C		
	Open	-20 ... +70 °C		
	Enclosed	-20 ... +35 °C		
Storage		-50 ... +80 °C		
Ambient air temperature compensation		Continuous		
Maximum operating altitude permissible		2000 m		
Resistance to shock acc. to IEC 60068-2-27		25 g / 11 ms		
Resistance to vibrations acc. to IEC 60068-2-6		2 g / 5-150 Hz	-	
Mounting position		Position 1-6 (optional for single mounting)		
Mounting		DIN-rail 35 mm (EN 60715)	DIN-rail 15 mm / 75 mm (EN 60715)	
Minimum distance to other units same type	Horizontal	0 mm	0 mm	
	Vertical - up to 240 V	-	50 mm	
	Vertical - up to 440 V	-	70 mm	
	Vertical - up to 500 V	-	110 mm	
	Vertical - up to 690 V	-	150 mm	
	Vertical	50 mm	-	
Minimum distance to electrical conductive board	Horizontal	10 mm	-	
	Horizontal - up to 500 V	-	10 mm	
	Horizontal - up to 690 V	-	30 mm	
	Vertical - up to 240 V	-	50 mm	
	Vertical - up to 440 V	-	70 mm	
	Vertical - up to 500 V	-	110 mm	
	Vertical - up to 690 V	-	150 mm	
	Vertical	50 mm	-	
Degree of protection	Enclosure / terminals	IP20		

Connecting characteristics

Main circuit

Type			MO450	MO495	MO496
Connecting capacity					
	Solid	**1 or 2 x**	0.75 ... 16 mm²	2.5 ... 16 mm²	2.5 ... 16 mm²
	Flexible	**1 x**	0.75 ... 35 mm²	10 ... 70 mm²	10 ... 70 mm²
		2 x	0.75 ... 25 mm²	10 ... 50 mm²	10 ... 50 mm²
	Stranded acc. to UL/CSA	**1 x**	AWG 18-2	AWG 10-2/0	AWG 10-2/0
		2 x	AWG 18-2	AWG 10-1/0	AWG 10-1/0
	Flexible acc. to UL/CSA	**1 x**	AWG 18-2	AWG 10-2/0	AWG 10-2/0
		2 x	AWG 18-2	AWG 10-1/0	AWG 10-1/0
Stripping length			13 mm	17 mm	17 mm
Tightening torques			3 - 4.5 Nm / 27 ... 40 lb.in	4 - 6 Nm / 35 - 53 lb.in	4 - 6 Nm / 35 - 53 lb.in
Connection screw			Pozidriv 2	Hexagon 4	Hexagon 4

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MO450, MO495, MO496 manual motor starters magnetic only
Main accessories

SA2

Description
Three-phase busbars ensure a quick and safe connection and are therefor a cost effective solution.
A variety of different three-phase busbars up to 108 A are in the assortment. Between 2 and 4 manual motor starter with none or two lateral auxiliary contacts can be connected.

Ordering details

Rated operational current A	Number of MMS	Number of lateral aux.	Type	Order code		Pkg qty	Weight (1 pce) kg
Three-phase busbars for MO450 only							
108	2	0	PS4-2-0	1SAM401911R1001		5	0.134
108	3	0	PS4-3-0	1SAM401911R1002		5	0.206
108	4	0	PS4-4-0	1SAM401911R1003		5	0.280
108	2	1	PS4-2-2	1SAM401911R1004		5	0.148
108	3	1	PS4-3-2	1SAM401911R1005		5	0.250
108	4	1	PS4-4-2	1SAM401911R1006		5	0.362

Rated operational current A	Rated cross section mm²	Mounting form	Type	Order code		Pkg qty	Weight (1 pce) kg
Three-phase feeder terminals for MO450 only							
108	25	Flat	S4-M1	1SAM401911R1007		2	0.106

Description	for MMS	Type	Order code		Pkg qty	Weight (1 pce) kg
Protection cover for busbar	PS4	BS4-3	1SAM401911R1008		10	0.001
Disconnector module	MO450	TB450	1SAM401910R1001		1	0.315
Terminal shroud	MO450	KA450	1SAM401908R1001		1	0.154
Terminal shroud	MO495	KA495	1SAM501901R1001		10	0.018
Terminal shroud	MO495	KA495C [1]	1SAM501902R1001		10	0.038
Terminal insulation barrier for UL508E	MO495	DX495	1SAM401912R1001		1	0.154
Padlock + 2 keys	MO450, MO495, MO496	SA2	GJF1101903R0002			

[1] is plugged onto the housing after removing the box terminals, if using cable lugs or buses

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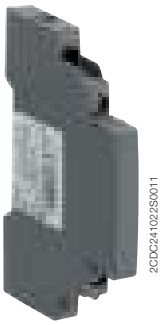
MO450, MO495, MO496 manual motor starters magnetic only
Main accessories

HK4-11



HKS4-20

SK4-11

AA4-24

Description

MO450, MO495, MO497 manual motor starters can be equipped with auxiliary contacts for lateral/front mounting, signalling contact for lateral mounting, undervoltage release and shunt trips. The accessories can be fitted wiring free and without tools. A variety of combinations is possible as required for the application. The auxiliary contacts change position with the main contacts. Undervoltage release are used for remote tripping of the manual motor starter especially for emergency stop circuits. Shunt trips release the MMS used for remote tripping.

Ordering details

Auxiliary contacts N.O.	Auxiliary contacts N.C.	Description	Type	Order code		Pkg qty	Weight (1 pce) kg
Auxiliary contacts – mountable on the front							
1	1		HK4-11	1SAM401901R1001		10	0.017
-	-	Changeover	HK4-W	1SAM401901R1002		10	0.015
Auxiliary contacts – mountable on the left							
1	1	Max. 1 pieces	HKS4-11	1SAM401902R1001		2	0.045
2	0	Max. 1 pieces	HKS4-20	1SAM401902R1002		2	0.045
0	2	Max. 1 pieces	HKS4-02	1SAM401902R1003		2	0.045
Signalling contacts – mountable on the right							
2	2	Separate signalling acc. UL508E 1 N.O. + 1 N.C. for short circuit and 1 N.O. + 1 N.C. for general tripping, max. 2 pieces	SK4-11	1SAM401904R1001		1	0.093

Rated control supply voltage V	Frequency Hz	Type	Order code		Pkg qty	Weight (1 pce) kg
Shunt trip units – mountable on the left						
20 ... 24	50/60	AA4-24	1SAM401907R1001		1	0.135
90 ... 110	50/60	AA4-110	1SAM401907R1002		1	0.135
200 ... 240	50/60	AA4-230	1SAM401907R1003		1	0.128
350 ... 415	50/60	AA4-400	1SAM401907R1004		1	0.125
Undervoltage releases – mountable on the left						
24	50/60	UA4-24	1SAM401905R1004		1	0.134
110/120	50/60	UA4-110	1SAM401905R1001		1	0.134
230/240	50/60	UA4-230	1SAM401905R1002		1	0.131
400/440	50/60	UA4-400	1SAM401905R1003		1	0.129
230/240	50/60	UA4-HK-230	1SAM401906R1001		1	0.140
400/440	50/60	UA4-HK-400	1SAM401906R1002		1	0.137

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MO450, MO495, MO496 manual motor starters magnetic only
Main accessories

General technical data

Type		PS4-xxx	S4-M1
Standards		IEC/EN 60947-1	
Rated operational voltage U_e		690 V AC	
Rated operational current I_e		108 A	
Rated frequency		50/60 Hz	
Rated impulse withstand voltage U_{imp}		6 kV	
Rated insulation voltage U_i		690 V AC	
Pollution degree		3	
Cross-section		10 mm²	25 mm²
Ambient air temperature	Operation	-25 ... +70 °C	
	Storage	-50 ... +80 °C	

Electrical connection

Main circuit

Type			S4-M1
Connecting capacity			
	Solid	1 x	2.5 ... 50 mm²
	Flexible	1 x	4 ... 16 mm²
	Stranded acc. to UL/CSA	1 x	AWG 14-4
	Flexible acc. to UL/CSA	1 x	AWG 14-4
Tightening torques			4 Nm
Connection screw			Pozidriv 2

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MO450, MO495, MO496 manual motor starters magnetic only
Main accessories

General technical data

Type		HK4-11	HK4-W	HKS4	SK4
Standards		IEC/EN 60947–1, IEC/EN 60947-5-1, UL 508, CSA22.2 No. 14			
Rated operational voltage U_e		230 V AC / 220 V DC	690 V AC / 220 V DC	690 V AC	690 V AC
Conventional free-air thermal current I_{th}		2.5 A	5 A	10 A	10 A
Rated frequency		DC, 50/60 Hz			
Rated impulse withstand voltage U_{imp}		6 kV			
Rated insulation voltage U_i		300 V	300 V	690 V	690 V
Pollution degree		3			
Ambient air temperature	Operation	-20 ... +70 °C			
	Storage	-50 ... +80 °C			
Resistance to shock acc. to IEC 60068-2-27		25 g / 11 ms			
Resistance to vibrations acc. to IEC 60068-2-6		2 g / 5 ... 150Hz			
Number of poles		1 N.C. + 1 N.O.	Changeover	1 N.C. + 1 N.O. / 2 N.O. / 2 N.C.	2 N.C. + 2 N.O.
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category					
	24 V, 50/60 Hz	2 A	4 A	6 A	6 A
	230 V, 50/60 Hz	0.5 A	3 A	4 A	4 A
	400 V, 50/60 Hz	-	1.5 A	3 A	3 A
	690 V, 50/60 Hz	-	0.5 A	1 A	1 A
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category					
	24 V	1 A	1 A	2 A	2 A
	48 V	0.3 A	-	-	-
	60 V	0.15 A	-	-	-
	110 V	-	0.22 A	0.5 A	0.5 A
	230 V	-	0.1 A	0.25 A	0.25 A
Minimum switching capacity		17 V / 1 mA		-	-
Short-circuit protective device		10 A Type gG			
Duty time		100 %			
Mounting		Front of MMS	Front of MMS	Left side of MMS	Left side of MMS
Mounting positions		1-6			
Mechanical durability		100000 cycles			
Electrical durability		100000 cycles			

Electrical connection

Main circuit

Type			HK4-11	HK4-W	HKS4	SK4
Connecting capacity						
	Solid	**1 x**	0.5... 2.5 mm²			
		2 x	0.5 ... 1.5 mm² or 0.75 ... 2.5 mm			
	Flexible	**1 x**	0.5 ... 2.5 mm²			
		2 x	0.5 ... 1.5 mm² or 0.75 ... 2.5 mm			
	Stranded acc. to UL/CSA	**1 or 2 x**	AWG 18-14			
	Flexible acc. to UL/CSA	**1 or 2 x**	AWG 18-14			
Stripping length			10 mm			
Tightening torques			0.8 ... 1.2 Nm / 7 ... 10.3 lb.in			
Connection screw			Pozidriv 2			

2CDC131038C0201

MO450, MO495, MO496 manual motor starters magnetic only
Main accessories

MSHD-LTB

MSHD-LTY

MSMN

MSOX-30

Description
The complete set includes handle, shaft and driver. All accessories fit 6 mm shafts of maximum 180 mm length. The degree of protection for handles MSHD is IP64.

Ordering details

Description	Shaft length mm	Type	Order code		Pkg qty	Weight (1 pce) kg
Shafts						
For selector type handles. Shaft diameter 6 mm. Shaft extension for door coupling driver.	85	OXS6X85	1SCA101647R1001		1	0.020
	105	OXS6X105	1SCA108043R1001		1	0.020
	130	OXS6X130	1SCA101655R1001		1	0.030
	180	OXS6X180	1SCA101659R1001		1	0.040

Description	Color	Type	Order code		Pkg qty	Weight (1 pce) kg
Selector type handles IP64						
Padlockable max. 3 padlocks with bail diameter 5 ... 8 mm, door interlock in ON position defeatable, for use with 6 mm OXS6...types up to 180 mm or driver shafts MSOX.	Black	MSHD-LTB [1]	1SAM201920R1011		1	0.065
	Yellow	MSHD-LTY [1]	1SAM201920R1012		1	0.065

[1] Indication I-O-T and ON-OFF-T

Description	Type	Order code		Pkg qty	Weight (1 pce) kg
Driver					
Coupling driver for use with 6 mm OXS6... types up to 180 mm.	MSMN [1]	1SAM101923R0002		1	0.002
	MSMNO [2]	1SAM101923R0012		1	0.002

[1] Coded - Positioning of ON indication dependent from mounting orientation of the MS
[2] Uncoded - Positioning of ON indication independent from mounting orientation of the MS

Description	Shaft length mm	Type	Order code		Pkg qty	Weight (1 pce) kg
Driver shafts						
Driver shaft - combination driver & shaft. Shaft diameter 6 mm.	32	MSOX-32 [1]	1SAM101924R0003		1	0.010
	30	MSOX-30 [2]	1SAM101924R0013		1	0.010

[1] MSOX-32 is for normal vertical use
[2] MSOX-30 is for horizontal use

2CDC131038C0201

MS325 manual motor starters
0.10 to 25 A – with thermal and electromagnetic protection

MS325-16

Description

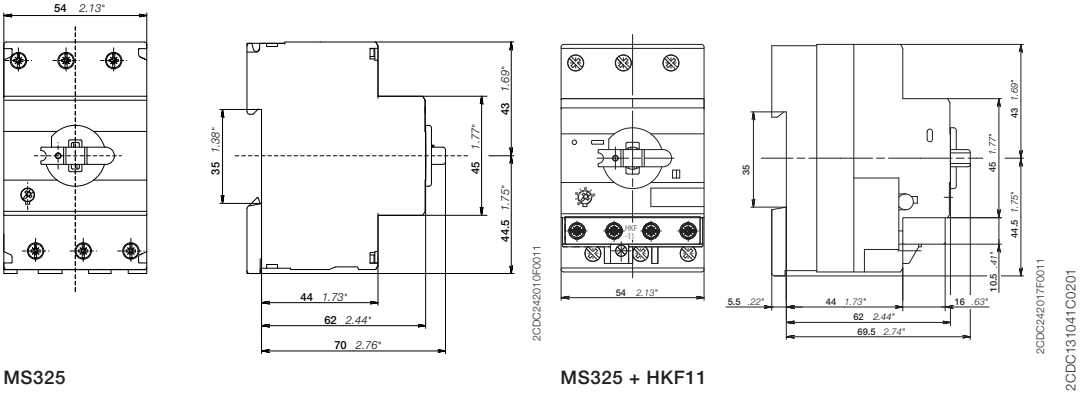
Manual motor starters (MMS) are protection devices for the main circuit. They combine motor control and protection in a single device. MMS are used mainly to switch motors manually ON/OFF and protect them and the installation fuse less against short-circuit, overload and phase failures. Fuse less protection with a manual motor starter saves costs, space and ensures a quick reaction under short-circuit condition, by switching off the motor within milliseconds.

MS325 is a compact and powerful range for motor protection up to 12.5 kW (400 V) / 25 A in width of 54 mm. Further features are the build-in disconnect function, temperature compensation, trip-free mechanism and a rotary handle with a clear switch position indication. The manual motor starters are suitable for three- and single-phase applications. Auxiliary contacts, signalling contacts, undervoltage releases, shunt trips, three-phase busbars, power in-feed blocks are available as accessories.

Ordering details

Rated operational power 400 V AC-3	Setting range	Short-circuit breaking capacity I_{cs} at 400 V AC	Rated instantaneous short-circuit current setting I_i	Type	Order code		Weight (1 pce)
kW	A	kA	A				kg
0.03	0.10 ... 0.16	100	1.56	MS325-0.16	1SAM150000R1001		0.280
0.06	0.16 ... 0.25	100	2.44	MS325-0.25	1SAM150000R1002		0.280
0.09	0.25 ... 0.40	100	3.9	MS325-0.4	1SAM150000R1003		0.280
0.12	0.40 ... 0.63	100	6.14	MS325-0.63	1SAM150000R1004		0.280
0.25	0.63 ... 1.00	100	11.5	MS325-1	1SAM150000R1005		0.310
0.55	1.00 ... 1.60	100	18.4	MS325-1.6	1SAM150000R1006		0.340
0.75	1.60 ... 2.50	100	28.75	MS325-2.5	1SAM150000R1007		0.340
1.5	2.50 ... 4.00	100	50	MS325-4	1SAM150000R1008		0.340
2.2	4.00 ... 6.30	100	78.75	MS325-6.3	1SAM150000R1009		0.340
4.0	6.30 ... 9.00	100	135	MS325-9	1SAM150000R1010		0.340
5.5	9.00 ... 12.5	75	180	MS325-12.5	1SAM150000R1011		0.340
7.5	12.5 ... 16.0	60	240	MS325-16	1SAM150000R1012		0.340
9.0	16.0 ... 20.0	55	300	MS325-20	1SAM150000R1013		0.340
12.5	20.0 ... 25.0	50	375	MS325-25	1SAM150000R1014		0.340
0.03	0.10 ... 0.16	100	1.56	MS325-0.16-HKF11	1SAM150005R0001		0.300
0.06	0.16 ... 0.25	100	2.44	MS325-0.25-HKF11	1SAM150005R0002		0.300
0.09	0.25 ... 0.40	100	3.9	MS325-0.4-HKF11	1SAM150005R0003		0.300
0.12	0.40 ... 0.63	100	6.14	MS325-0.63-HKF11	1SAM150005R0004		0.300
0.25	0.63 ... 1.00	100	11.5	MS325-1-HKF11	1SAM150005R0005		0.330
0.55	1.00 ... 1.60	100	18.4	MS325-1.6-HKF11	1SAM150005R0006		0.360
0.75	1.60 ... 2.50	100	28.75	MS325-2.5-HKF11	1SAM150005R0007		0.360
1.5	2.50 ... 4.00	100	50	MS325-4-HKF11	1SAM150005R0008		0.360
2.2	4.00 ... 6.30	100	78.75	MS325-6.3-HKF11	1SAM150005R0009		0.360
4.0	6.30 ... 9.00	100	135	MS325-9-HKF11	1SAM150005R0010		0.360
5.5	9.00 ... 12.5	75	180	MS325-12.5-HKF11	1SAM150005R0011		0.360
7.5	12.5 ... 16.0	60	240	MS325-16-HKF11	1SAM150005R0012		0.360
9.0	16.0 ... 20.0	55	300	MS325-20-HKF11	1SAM150005R0013		0.360
12.5	20.0 ... 25.0	50	375	MS325-25-HKF11	1SAM150005R0014		0.360

Main dimensions mm, *inches*



MS325

MS325 + HKF11

MS325 manual motor starters
Technical data

Main circuit – Utilization characteristics according to IEC/EN

Type	MS325
Standards	IEC/EN 60947–2, IEC/EN 60947-4-1, IEC/EN 60947-1
Rated operational voltage U_e	690 V AC / 440 V DC
Rated frequency	50/60 Hz
Trip class	10A
Number of poles	3
Duty time	100 %
Rated impulse withstand voltage U_{imp}	6 kV
Rated insulation voltage U_i	690 V AC
Rated operational current I_e	See ordering details
Rated instantaneous short-circuit current setting I_i	See ordering details
Rated service short-circuit breaking capacity I_{cs}	See table "Short-circuit breaking capacity and back-up fuses"
Rated ultimate short-circuit breaking capacity I_{cu}	See table "Short-circuit breaking capacity and back-up fuses"

Short-circuit breaking capacity and back-up fuses

I_{cs} Rated service short-circuit breaking capacity

I_{cu} Rated ultimate short-circuit breaking capacity

I_{cc} Prospective short-circuit current at installation location

Note: Maximum rated current of the back-up fuses if $I_{cc} > I_{cs}$

Type	230 V AC			400 V AC			440 V AC			500 V AC			690 V AC		
	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A
MS325-0.16															
MS325-0.25															
MS325-0.4															
MS325-0.63															
MS325-1															
MS325-1.6															
MS325-2.5													40	40	25
MS325-4										60	60	40	10	10	40
MS325-6.3							70	70	50	40	40	50	7	7	40
MS325-9							50	50	80	30	30	80	5	5	50
MS325-12.5				75	75	80	45	45	80	27	27	80	4.5	4.5	50
MS325-16				60	60	100	40	40	100	25	25	100	4	4	50
MS325-20				55	55	100	35	35	100	22	22	100	3.5	3.5	50
MS325-25				50	50	125	30	30	125	20	20	125	3	3	50

No back-up fuse required up to I_{cc} = 100 kA

MS325-9: No need for back-up fuse in networks with a prospective current of up to 100 kA at 400 V.
MS325-16: No need for back-up fuse in networks with a prospective current of up to 60 kA at 400 V.
With an approbiate 100 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA

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MS325 manual motor starters
Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type		MS325
Standards		UL 508, CSA 22.2 No. 14
Maximum operational voltage		600 V AC
Manual motor controller ratings		See table "UL 508 – Manual motor controller"
Trip rating		125 % FLA
Motor ratings	Horse power	See table "Motor rating, three phase"
	Full load amps (FLA)	See table "Motor rating, three phase"
	Locked rotor amps (LRA)	See table "Motor rating, three phase"

Motor rating, three phase

hp Horse power

FLA Full load amps

LRA Locked rotor amps

Type	220-240 V AC			440-480 V AC			500-600 V AC		
	hp	FLA	LRA	hp	FLA	LRA	hp	FLA	LRA
MS325-0.16	-	0.16	0.96	-	0.16	0.96	-	0.16	0.96
MS325-0.25	-	0.25	1.5	-	0.25	1.5	-	0.25	1.5
MS325-0.4	-	0.4	2.4	-	0.4	2.4	-	0.4	2.4
MS325-0.63	-	0.63	3.78	-	0.63	3.78	-	0.63	3.78
MS325-1	-	1.0	6.0	1/2	1.1	10.0	1/2	0.9	8.0
MS325-1.6	-	1.6	9.6	3/4	1.6	12.5	3/4	1.3	10.0
MS325-2.5	1/2	2.2	20.0	1	2.1	15.0	1-1/2	2.4	16.0
MS325-4	1	4.2	30.0	2	3.4	25.0	3	3.9	25.6
MS325-6.3	1-1/2	6.0	40.0	3	4.8	32.0	5	6.1	36.8
MS325-9	2-1/2			5	7.6	46.0	7-1/2	9.0	50.8
MS325-12.5	3	9.6	64.0	7-1/2	11.0	63.5	10	11.0	64.8
MS325-16	5	15.2	92.0	10	14.0	81.0	10	11.0	64.8
MS325-20	5	15.2	92.0	10	14.0	81.0	15	27.0	93.0
MS325-25	7-1/2	22.0	127.0	15	21.0	116.0	20	35.0	116.0

UL 508 – Manual motor controller

Type	Max. Circuit Breaker UL/NEC	Max. Circuit Breaker UL/NEC	Max. fuse type UL/NEC	Maximum fuse type K5 o. RK5 per UL/NEC	Maximum short-circuit current for motor disconnect[1]		for group installation		for Tap Conductor Protection	UL 508 Type E
	480 V	600 V	480 V	600 V	480 V	600 V	480 V	600 V	480Y/277V	480Y/277V
			A	A	kA	kA	kA	kA	kA	kA
MS325-0.16	-	S7H1200	1600 (class L)	1200	85	50	85	50	18	18
MS325-0.25	-	S7H1200	1600 (class L)	1200	85	50	85	50	18	18
MS325-0.4	-	S7H1200	1600 (class L)	1200	85	50	85	50	18	18
MS325-0.63	-	S7H1200	1600 (class L)	1200	85	50	85	50	18	18
MS325-1	-	S7H1200	1600 (class L)	1200	85	50	85	50	18	18
MS325-1.6	-	S7H1200	1600 (class L)	1200	85	50	85	50	18	18
MS325-2.5	-	S7H1200	1600 (class L)	1200	85	50	85	50	18	18
MS325-4	-	S7H1200	1600 (class L)	1200	85	50	85	50	18	18
MS325-6.3	S7H1200	S7H1200	600 (class K5)	1200	50	50	50	50	18	18
MS325-9	S7H1200	S4H2500	600 (class K5)	250	50	50	50	50	18	18
MS325-12.5	S4H250	S7H1200	400 (class K5)	1200	50	30	50	30	18	18
MS325-16	S4H250	S7H1200	400 (class K5)	1200	50	30	50	30	18	18
MS325-20	S4H250	S4H250	400 (class K5)	250	50	30	50	30	18	18
MS325-25	S4H250	S4H250	400 (class K5)	250	50	30	50	30	18	18

[1] Suitable as motor disconnect only when provided with padlock SA1 or SA3...

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MS325 manual motor starters
Technical data

General technical data

Type		MS325
Pollution degree		3
Phase loss sensitive		Yes
Ambient air temperature		
Operation	Open - compensated without derating	-25 ... +70 °C
	Open	-25 ... +70 °C
	Enclosed (IB325)	0 ... +40 °C
Storage		-50 ... +80 °C
Ambient air temperature compensation		Continuous
Maximum operating altitude permissible		2000 m
Resistance to shock acc. to IEC 60068-2-27		15 g / 1/2 sinusoidal shock for 11 ms
Resistance to vibrations acc. to IEC 60068-2-6		5 g / 3 ... 150 Hz
Mounting position		Position 1-6 (optional for single mounting)
Mounting		DIN-rail (EN 60715)
Minimum distance to other units same type	Horizontal	0 mm
	Vertical	100 mm
Minimum distance to electrical conductive board	Horizontal, up to 400 V	> 1.5 mm
	Horizontal, up to 690 V	> 1.5 mm
	Vertical	75 mm
Degree of protection	Enclosure / terminals	IP20

Connecting characteristics

Main circuit

Type			MS325
Connecting capacity			
	Solid	**1 x**	1 x 1 ... 10 mm²
		2 x	2 x 1 ... 6 mm²
	Flexible	**1 x**	1 x 1 ... 6 mm²
		2 x	2 x 0.75 ... 4 mm²
	Stranded acc. to UL/CSA	**1 or 2 x**	AWG 14-8
	Flexible acc. to UL/CSA	**1 or 2 x**	AWG 14-8
Stripping length			10 mm
Tightening torques			1.4 Nm / 14 lb.in
Connection screw			M3.5 (Pozidriv 2)

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MS325 manual motor starters
Main accessories

SA1

SA2

SA3

Description

Three-phase busbars ensure a quick and safe connection and are therefore a cost effective solution.
A variety of different three-phase busbars up to 63 A are in the assortment. Between 2 and 5 manual motor starters with none, one or two lateral auxiliary contacts can be connected. Different three-phase feeder terminals are available according to the application.

Ordering details

Rated operational current A	Number of MMS	Number of lateral aux.	Type	Order code		Pkg qty	Weight (1 pce) kg
Three-phase busbars							
63	2	0	PS3-2-0	1SAM101937R0012		10	0.038
63	3	0	PS3-3-0	1SAM101937R0013		10	0.062
63	4	0	PS3-4-0	1SAM101937R0014		10	0.087
63	5	0	PS3-5-0	1SAM101937R0015		10	0.115
63	6	0	PS3-6-0	1SAM101937R0016		10	0.137
63	2	1	PS3-2-1	1SAM101937R0022		10	0.040
63	3	1	PS3-3-1	1SAM101937R0023		10	0.068
63	4	1	PS3-4-1	1SAM101937R0024		10	0.097
63	5	1	PS3-5-1	1SAM101937R0025		10	0.126
63	3	2	PS3-2-2	1SAM101937R0032		10	0.043
63	4	2	PS3-4-2	1SAM101937R0034		10	0.106

Rated operational current A	Rated cross section mm²	Mounting form	Type	Order code		Pkg qty	Weight (1 pce) kg
Three-phase feeder terminals							
63	25	Flat	S3-M1	1SAM101938R0001		10	0.041
63	25	High	S3-M2	1SAM101938R0002		10	0.053
63	35	UL type E and IEC	S3-M3	1SAM101938R0004		10	0.050

Description	Type	Order code		Pkg qty	Weight (1 pce) kg
Protection cover for busbars	BS3-3	1SAM101938R0003		50	0.001
Lock handle	SA1	GJF1101903R0001		10	0.003
Padlock	SA2	GJF1101903R0002		10	0.020
Lock handle box SA1/SA2	SA3	GJF1101903R0003		10	0.050

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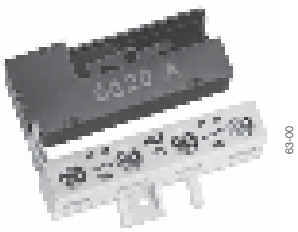
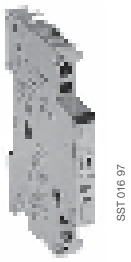
MS325 manual motor starters
Main accessories



HKF



HK

SK

Description

MS325 manual motor starters can be equipped with auxiliary contacts for lateral/front mounting, signalling contact for lateral mounting, undervoltage release and shunt trips. A variety of combinations is possible as required for the application. The auxiliary contacts change position with the main contacts. The signalling contact signals tripping regardless if it was caused by short-circuit or overload. Undervoltage release are used for remote tripping of the manual motor starter especially for emergency stop circuits. Shunt trips release the MMS used for remote tripping

Ordering details

Auxiliary contacts N.O.	Auxiliary contacts N.C.	Description	Type	Order code		Pkg qty	Weight (1 pce) kg
Auxiliary contacts – mountable on the front							
1	1		HKF-11	1SAM101928R0001		10	0.015
2	0		HKF-20	1SAM101928R0002		10	0.020
Auxiliary contacts – mountable on the left							
1	1	Max. 2 pieces	HK-11	1SAM101901R0001		2	0.030
2	0	Max. 2 pieces	HK-20	1SAM101901R0002		2	0.030
0	2	Max. 2 pieces	HK-02	1SAM101901R0003		2	0.030
Signalling contacts – mountable on the left							
1	1	For tripped alarm, max. 1 pieces	SK-11	1SAM101904R0003		10	0.030
Signalling contacts – mountable on the right							
1	1	For short-circuit alarm	CK-11	1SAM101943R0001		10	0.035

Rated control supply voltage V	Frequency Hz	Type	Order code		Pkg qty	Weight (1 pce) kg
Shunt trip units – mountable as slide in						
24 ... 60	50/60	AA-24	1SAM101909R0001		10	0.025
110 ... 240	50/60	AA-230	1SAM101909R0002		10	0.025
220 ... 415	50/60	AA-400	1SAM101909R0003		10	0.025
Undervoltage releases – mountable as slide in						
24	50	UAF-24	1SAM101903R0024		10	0.02
48	50	UAF-48	1SAM101903R0048		10	0.02
60	50	UAF-60	1SAM101903R0060		10	0.02
110	50	UAF-110	1SAM101903R0110		10	0.02
230	50	UAF-230	1SAM101903R0230		10	0.02
400	50	UAF-400	1SAM101903R0400		10	0.02
415	50	UAF-415	1SAM101903R0415		10	0.02
500	50	UAF-500	1SAM101903R0500		10	0.02

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MS325 manual motor starters
Main accessories

General technical data

Type		PS3	S3-M1/S3-M2	S3-M3
Standards		IEC/EN 60947-2, IEC/EN 60947-4-1, IEC/EN 60947-1		
Rated operational voltage U_e		690 V AC		
Rated operational current I_e		63 A		
Rated frequency		50/60 Hz		
Rated impulse withstand voltage U_{imp}		6 kV		
Rated insulation voltage U_i		690 V AC		
Pollution degree		3		
Cross-section		10 mm²	25 mm²	
Ambient air temperature	Operation	-25 ... +70 °C		
	Storage	-50 ... +80 °C		
Resistance to shock acc. to IEC 60068-2-27		15 g / 11 ms		
Resistance to vibrations acc. to IEC 60068-2-6		3 g / 3 ... 150 Hz		

Electrical connection

Main circuit

Type			PS3, S3-Mx
Connecting capacity			
	Solid	1 x	6 ... 25 mm²
	Flexible	1 x	6 ... 16 mm²
	Stranded acc. to UL/CSA	1 x	AWG 10-4
	Flexible acc. to UL/CSA	1 x	AWG 10-6
Stripping length			10 mm
Tightening torques			2.5 Nm / 22 lb.in
Connection screw			PZ2 (6 mm)

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MS325 manual motor starters
Main accessories

IB325-Y

IB325-G

DMS325-Y

DMS325-G

Description

IB325 are IP65 enclosures for single MMS installation. Additional mounting of auxiliary and signalling contacts, shunt trips and undervoltage release is possible. The handle is lockable in OFF position. For detailed specification see installation instruction.

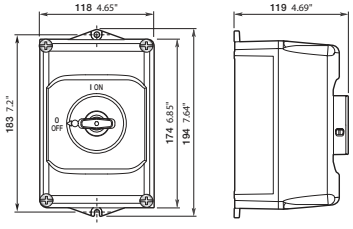
DMS325 are IP65 door mounting kits for MMS installation in any enclosure. Additional mounting of auxiliary, signalling, shunt trips and undervoltage release is possible. The handle is lockable in OFF position. For detailed specification see installation instruction.

Ordering details

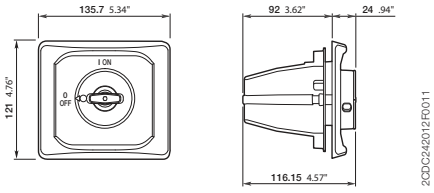
Description	Color	Type	Order code		Pkg qty	Weight (1 pce) kg
Enclosures IP65						
Padlockable max. 3 padlocks with bail diameter 4 ... 6.5 mm	Yellow/red	IB325-G	1SAM101940R1000		1	0.370
	Grey/black	IB325-Y	1SAM101940R1001		1	0.370
Door mounting kit IP65						
Padlockable max. 3 padlocks with bail diameter 4 ... 6.5 mm	Yellow/red	DMS325-G	1SAM101941R1000		1	0.170
	Grey/black	DMS325-Y	1SAM101941R1001		1	0.170

Indication I-O and ON-OFF

Main dimensions mm, *inches*



IB325



DMS325

MS325 manual motor starters
Main accessories

MSHD-LB

MSHD-LY

MSMN

MSOX-30

Description

The complete set includes handle, shaft and driver. All accessories fit 6 mm shafts of maximum 180 mm length. The degree of protection for handles MSHD is IP64.

Ordering details

Description	Shaft length mm	Type	Order code		Pkg qty	Weight (1 pce) kg
Shafts						
For selector type handles. Shaft diameter 6 mm. Shaft extension for door coupling driver.	85	OXS6X85	1SCA101647R1001		1	0.020
	105	OXS6X105	1SCA108043R1001		1	0.020
	130	OXS6X130	1SCA101655R1001		1	0.030
	180	OXS6X180	1SCA101659R1001		1	0.040

Description	Color	Type	Order code		Pkg qty	Weight (1 pce) kg
Selector type handles IP64						
Padlockable max. 3 padlocks with bail diameter 5 ... 8 mm, door interlock in ON position defeatable, for use with 6 mm OXS6...types up to 180 mm or driver shafts MSOX.	Black	MSHD-LB [1]	1SAM201920R1001		1	0.065
	Yellow	MSHD-LY	1SAM201920R1002		1	0.065

[1] Indication I-O and ON-OFF

Description	Type	Order code		Pkg qty	Weight (1 pce) kg
Driver					
Coupling driver for use with 6 mm OXS6... types up to 180 mm.	MSMN [1]	1SAM101923R0002		1	0.002
	MSMNO [2]	1SAM101923R0012		1	0.002

[1] Coded - Positioning of ON indication dependent from mounting orientation of the MS
[2] Uncoded - Positioning of ON indication independent from mounting orientation of the MS

Description	Shaft length mm	Type	Order code		Pkg qty	Weight (1 pce) kg
Driver shafts						
Driver shaft - combination driver & shaft. Shaft diameter 6 mm.	32	MSOX-32 [1]	1SAM101924R0003		1	0.010
	30	MSOX-30 [2]	1SAM101924R0013		1	0.010

[1] MSOX-32 is for normal vertical use
[2] MSOX-30 is for horizontal use

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MO325 manual motor starters magnetic only
0.4 to 25 A – with electromagnetic protection

MO325-16

Description

The MO325 manual motor starters magnetic only are 54 mm width devices. These devices are used to manually switch on and off motors and to protect them reliably and without the need for a fuse from short-circuits.

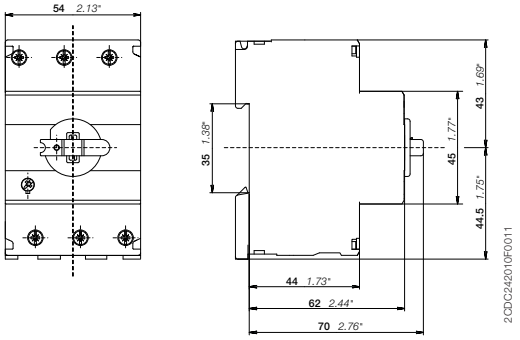
Further features are the build-in disconnect function, trip-free mechanism and a rotary handle with a clear switch position indication. The manual motor starter magnetic only is suitable for three- and single-phase applications. Auxiliary contacts, signalling contacts, undervoltage releases, shunt trips, three-phase busbars, power in-feed blocks are available as accessory.

Ordering details

Rated operational power 400 V AC-3[1]	Rated operational current	Short-circuit breaking capacity I_{cs} at 400 V AC	Rated instantaneous short-circuit current setting I_i	Type	Order code		Weight (1 pce)
kW	A	kA	A				kg
0.09	0.40	100	3.9	MO325-0.4	1SAM160000R1003		0.280
0.12	0.63	100	6.14	MO325-0.63	1SAM160000R1004		0.280
0.25	1.0	100	11.5	MO325-1	1SAM160000R1005		0.310
0.55	1.6	100	18.4	MO325-1.6	1SAM160000R1006		0.340
0.75	2.5	100	28.75	MO325-2.5	1SAM160000R1007		0.340
1.5	4.0	100	50	MO325-4	1SAM160000R1008		0.340
2.2	6.3	100	78.75	MO325-6.3	1SAM160000R1009		0.340
4.0	9.0	100	135	MO325-9	1SAM160000R1010		0.340
5.5	12.5	75	180	MO325-12.5	1SAM160000R1011		0.340
7.5	16	60	240	MO325-16	1SAM160000R1012		0.340
9.0	20	55	300	MO325-20	1SAM160000R1013		0.340
12.5	25	50	375	MO325-25	1SAM160000R1014		0.340

[1] For overload protection of motors, an appropriate thermal or electronic overload relay must be used

Main dimensions mm, *inches*



MO325

MO325 manual motor starters magnetic only
Technical data

Main circuit – Utilization characteristics according to IEC/EN

Type	MO325
Standards	IEC/EN 60947–2, IEC/EN 60947-4-1, IEC/EN 60947-1
Rated operational voltage U_e	690 V AC / 440 V DC
Rated frequency	50/60 Hz
Number of poles	3
Duty time	100 %
Rated impulse withstand voltage U_{imp}	6 kV
Rated insulation voltage U_i	690 V AC
Rated operational current I_e	See ordering details
Rated instantaneous short-circuit current setting I_i	See ordering details
Rated service short-circuit breaking capacity I_{cs}	See table "Short-circuit breaking capacity and back-up fuses"
Rated ultimate short-circuit breaking capacity I_{cu}	See table "Short-circuit breaking capacity and back-up fuses"

Short-circuit breaking capacity and back-up fuses

I_{cs} Rated service short-circuit breaking capacity

I_{cu} Rated ultimate short-circuit breaking capacity

I_{cc} Prospective short-circuit current at installation location

Note: Maximum rated current of the back-up fuses if $I_{cc} > I_{cs}$

Type	230 V AC			400 V AC			440 V AC			500 V AC			690 V AC		
	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A
MO325-0.4	No back-up fuse required up to I_{cc} = 100 kA														
MO325-0.63															
MO325-1															
MO325-1.6															
MO325-2.5															
MO325-4															
MO325-6.3													40	40	25
MO325-9										60	60	40	10	10	40
MO325-12.5							70	70	50	40	40	50	7	7	40
MO325-16							50	50	80	30	30	80	5	5	50
MO325-20				75	75	80	45	45	80	27	27	80	4.5	4.5	50
MO325-25				60	60	100	40	40	100	25	25	100	4	4	50

MO325-9: No need for back-up fuse in networks with a prospective current of up to 100 kA at 400 V.
MO325-16: No need for back-up fuse in networks with a prospective current of up to 60 kA at 400 V.
With an approbiate 100 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA

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MO325 manual motor starters magnetic only
Technical data

General technical data

Type		MO325
Pollution degree		3
Phase loss sensitive		Yes
Ambient air temperature		
Operation	Open - compensated without derating	-25 ... +70 °C
	Open	-25 ... +70 °C
	Enclosed (IB132)	0 ... +40 °C
Storage		-50 ... +80 °C
Ambient air temperature compensation		Continuous
Maximum operating altitude permissible		2000 m
Resistance to shock acc. to IEC 60068-2-27		15 g / 1/2 sinusoidal shock for 11 ms
Resistance to vibrations acc. to IEC 60068-2-6		5 g / 3 ... 150 Hz
Mounting position		Position 1-6 (optional for single mounting)
Group mounting		
Minimum distance to other units same type	Horizontal	0 mm
	Vertical	100 mm
Minimum distance to electrical conductive board	Horizontal, up to 400 V	> 1.5 mm
	Horizontal, up to 690 V	> 1.5 mm
	Vertical	75 mm
Degree of protection	Enclosure / terminals	IP20

Connecting characteristics

Main circuit

Type			MO325
Connecting capacity			
	Solid	**1 x**	1 x 1 ... 10 mm²
		2 x	2 x 1 ... 6 mm²
	Flexible	**1 x**	1 x 1 ... 6 mm²
		2 x	2 x 0.75 ... 4 mm²
	Stranded acc. to UL/CSA	**1 or 2 x**	AWG 14-8
	Flexible acc. to UL/CSA	**1 or 2 x**	AWG 14-8
Stripping length			10 mm
Tightening torques			1.4 Nm / 14 lb.in
Connection screw			M3.5 (Pozidriv 2)

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MO325 manual motor starters magnetic only
Main accessories

SA1

SA2

SA3

Description

Three-phase busbars ensure a quick and safe connection and are therefore a cost effective solution. A variety of different three-phase busbars up to 63 A are in the assortment. Between 2 and 5 manual motor starters with none, one or two lateral auxiliary contacts can be connected. Different three-phase feeder terminals are available according to the application.

Ordering details

Rated operational current A	Number of MMS	Number of lateral aux.	Type	Order code		Pkg qty	Weight (1 pce) kg
Three-phase busbars							
63	2	0	PS3-2-0	1SAM101937R0012		10	0.038
63	3	0	PS3-3-0	1SAM101937R0013		10	0.062
63	4	0	PS3-4-0	1SAM101937R0014		10	0.087
63	5	0	PS3-5-0	1SAM101937R0015		10	0.115
63	6	0	PS3-6-0	1SAM101937R0016		10	0.137
63	2	1	PS3-2-1	1SAM101937R0022		10	0.040
63	3	1	PS3-3-1	1SAM101937R0023		10	0.068
63	4	1	PS3-4-1	1SAM101937R0024		10	0.097
63	5	1	PS3-5-1	1SAM101937R0025		10	0.126
63	3	2	PS3-2-2	1SAM101937R0032		10	0.043
63	4	2	PS3-4-2	1SAM101937R0034		10	0.106

Rated operational current A	Rated cross section mm²	Mounting form	Type	Order code		Pkg qty	Weight (1 pce) kg
Three-phase feeder terminals							
63	25	Flat	S3-M1	1SAM101938R0001		10	0.041
63	25	High	S3-M2	1SAM101938R0002		10	0.053
63	35	UL type E and IEC	S3-M3	1SAM101938R0004		10	0.050

Description	Type	Order code		Pkg qty	Weight (1 pce) kg
Protection cover for busbars	BS3-3	1SAM101938R0003		50	0.001
Lock handle	SA1	GJF1101903R0001		10	0.003
Padlock	SA2	GJF1101903R0002		10	0.020
Lock handle box SA1/SA2	SA3	GJF1101903R0003		10	0.050

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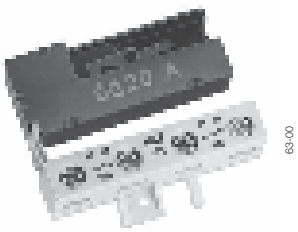
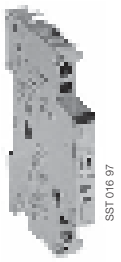
MO325 manual motor starters magnetic only
Main accessories



HKF



HK

SK

Description

MS325 manual motor starters can be equipped with auxiliary contacts for lateral/front mounting, signalling contact for lateral mounting, undervoltage release and shunt trips. A variety of combinations is possible as required for the application. The auxiliary contacts change position with the main contacts. The signalling contact signals tripping regardless if it was caused by short-circuit or overload. Undervoltage release are used for remote tripping of the manual motor starter especially for emergency stop circuits. Shunt trips release the MMS used for remote tripping

Ordering details

Auxiliary contacts N.O.	Auxiliary contacts N.C.	Description	Type	Order code		Pkg qty	Weight (1 pce) kg
Auxiliary contacts – mountable on the front							
1	1		HKF-11	1SAM101928R0001		10	0.015
2	0		HKF-20	1SAM101928R0002		10	0.020
Auxiliary contacts – mountable on the left							
1	1	Max. 2 pieces	HK-11	1SAM101901R0001		2	0.030
2	0	Max. 2 pieces	HK-20	1SAM101901R0002		2	0.030
0	2	Max. 2 pieces	HK-02	1SAM101901R0003		2	0.030
Signalling contacts – mountable on the left							
1	1	For tripped alarm, max. 1 pieces	SK-11	1SAM101904R0003		10	0.030
Signalling contacts – mountable on the right							
1	1	For short-circuit alarm	CK-11	1SAM101943R0001		10	0.035

Rated control supply voltage V	Frequency Hz	Type	Order code		Pkg qty	Weight (1 pce) kg
Shunt trip units – mountable as slide in						
24 ... 60	50/60	AA-24	1SAM101909R0001		10	0.025
110 ... 240	50/60	AA-230	1SAM101909R0002		10	0.025
220 ... 415	50/60	AA-400	1SAM101909R0003		10	0.025
Undervoltage releases – mountable as slide in						
24	50	UAF-24	1SAM101903R0024		10	0.02
48	50	UAF-48	1SAM101903R0048		10	0.02
60	50	UAF-60	1SAM101903R0060		10	0.02
110	50	UAF-110	1SAM101903R0110		10	0.02
230	50	UAF-230	1SAM101903R0230		10	0.02
400	50	UAF-400	1SAM101903R0400		10	0.02
415	50	UAF-415	1SAM101903R0415		10	0.02
500	50	UAF-500	1SAM101903R0500		10	0.02

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MO325 manual motor starters magnetic only
Main accessories

General technical data

Type		PS3	S3-M1/S3-M2	S3-M3
Standards		IEC/EN 60947-2, IEC/EN 60947-4-1, IEC/EN 60947-1		
Rated operational voltage U_e		690 V AC		
Rated operational current I_e		63 A		
Rated frequency		50/60 Hz		
Rated impulse withstand voltage U_{imp}		6 kV		
Rated insulation voltage U_i		690 V AC		
Pollution degree		3		
Cross-section		10 mm²	25 mm²	
Ambient air temperature	Operation	-25 ... +70 °C		
	Storage	-50 ... +80 °C		
Resistance to shock acc. to IEC 60068-2-27		15 g / 11 ms		
Resistance to vibrations acc. to IEC 60068-2-6		3 g / 3 ... 150 Hz		

Electrical connection

Main circuit

Type			PS3, S3-Mx
Connecting capacity			
	Solid	1 x	6 ... 25 mm²
	Flexible	1 x	6 ... 16 mm²
	Stranded acc. to UL/CSA	1 x	AWG 10-4
	Flexible acc. to UL/CSA	1 x	AWG 10-6
Stripping length			10 mm
Tightening torques			2.5 Nm / 22 lb.in
Connection screw			PZ2 (6 mm)

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MO325 manual motor starters magnetic only
Main accessories

IB325-Y

IB325-G

DMS325-Y

DMS325-G

Description

IB325 are IP65 enclosures for single MMS installation. Additional mounting of auxiliary and signalling contacts, shunt trips and undervoltage release is possible. The handle is lockable in OFF position. For detailed specification see installation instruction.

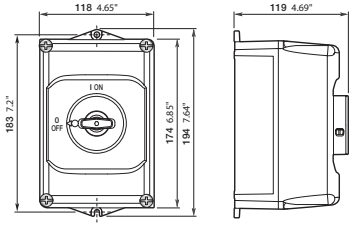
DMS325 are IP65 door mounting kits for MMS installation in any enclosure. Additional mounting of auxiliary, signalling, shunt trips and undervoltage release is possible. The handle is lockable in OFF position. For detailed specification see installation instruction.

Ordering details

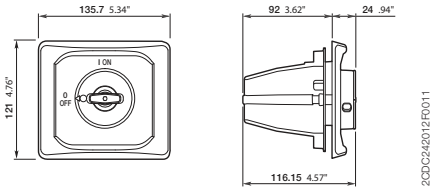
Description	Color	Type	Order code		Pkg qty	Weight (1 pce) kg
Enclosures IP65						
Padlockable max. 3 padlocks with bail diameter 4 ... 6.5 mm	Yellow/red	IB325-G	1SAM101940R1000		1	0.370
	Grey/black	IB325-Y	1SAM101940R1001		1	0.370
Door mounting kit IP65						
Padlockable max. 3 padlocks with bail diameter 4 ... 6.5 mm	Yellow/red	DMS325-G	1SAM101941R1000		1	0.170
	Grey/black	DMS325-Y	1SAM101941R1001		1	0.170

Indication I-O and ON-OFF

Main dimensions mm, *inches*



IB325



DMS325

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MO325 manual motor starters magnetic only
Main accessories

MSHD-LB

MSHD-LY

MSMN

MSOX-30

Description

The complete set includes handle, shaft and driver. All accessories fit 6 mm shafts of maximum 180 mm length. The degree of protection for handles MSHD is IP64.

Ordering details

Description	Shaft length mm	Type	Order code		Pkg qty	Weight (1 pce) kg
Shafts						
For selector type handles. Shaft diameter 6 mm. Shaft extension for door coupling driver.	85	OXS6X85	1SCA101647R1001		1	0.020
	105	OXS6X105	1SCA108043R1001		1	0.020
	130	OXS6X130	1SCA101655R1001		1	0.030
	180	OXS6X180	1SCA101659R1001		1	0.040

Description	Color	Type	Order code		Pkg qty	Weight (1 pce) kg
Selector type handles IP64						
Padlockable max. 3 padlocks with bail diameter 5 ... 8 mm, door interlock in ON position defeatable, for use with 6 mm OXS6...types up to 180 mm or driver shafts MSOX.	Black	MSHD-LB [1]	1SAM201920R1001		1	0.065
	Yellow	MSHD-LY [2]	1SAM201920R1002		1	0.065

[1] Indication I-O and ON-OFF
[2] Indication I-O-T and ON-OFF-T

Description	Type	Order code		Pkg qty	Weight (1 pce) kg
Driver					
Coupling driver for use with 6 mm OXS6... types up to 180 mm.	MSMN [1]	1SAM101923R0002		1	0.002
	MSMNO [2]	1SAM101923R0012		1	0.002

[1] Coded - Positioning of ON indication dependent from mounting orientation of the MS
[2] Uncoded - Positioning of ON indication independent from mounting orientation of the MS

Description	Shaft length mm	Type	Order code		Pkg qty	Weight (1 pce) kg
Driver shafts						
Driver shaft - combination driver & shaft. Shaft diameter 6 mm.	32	MSOX-32 [1]	1SAM101924R0003		1	0.010
	30	MSOX-30 [2]	1SAM101924R0013		1	0.010

[1] MSOX-32 is for normal vertical use
[2] MSOX-30 is for horizontal use

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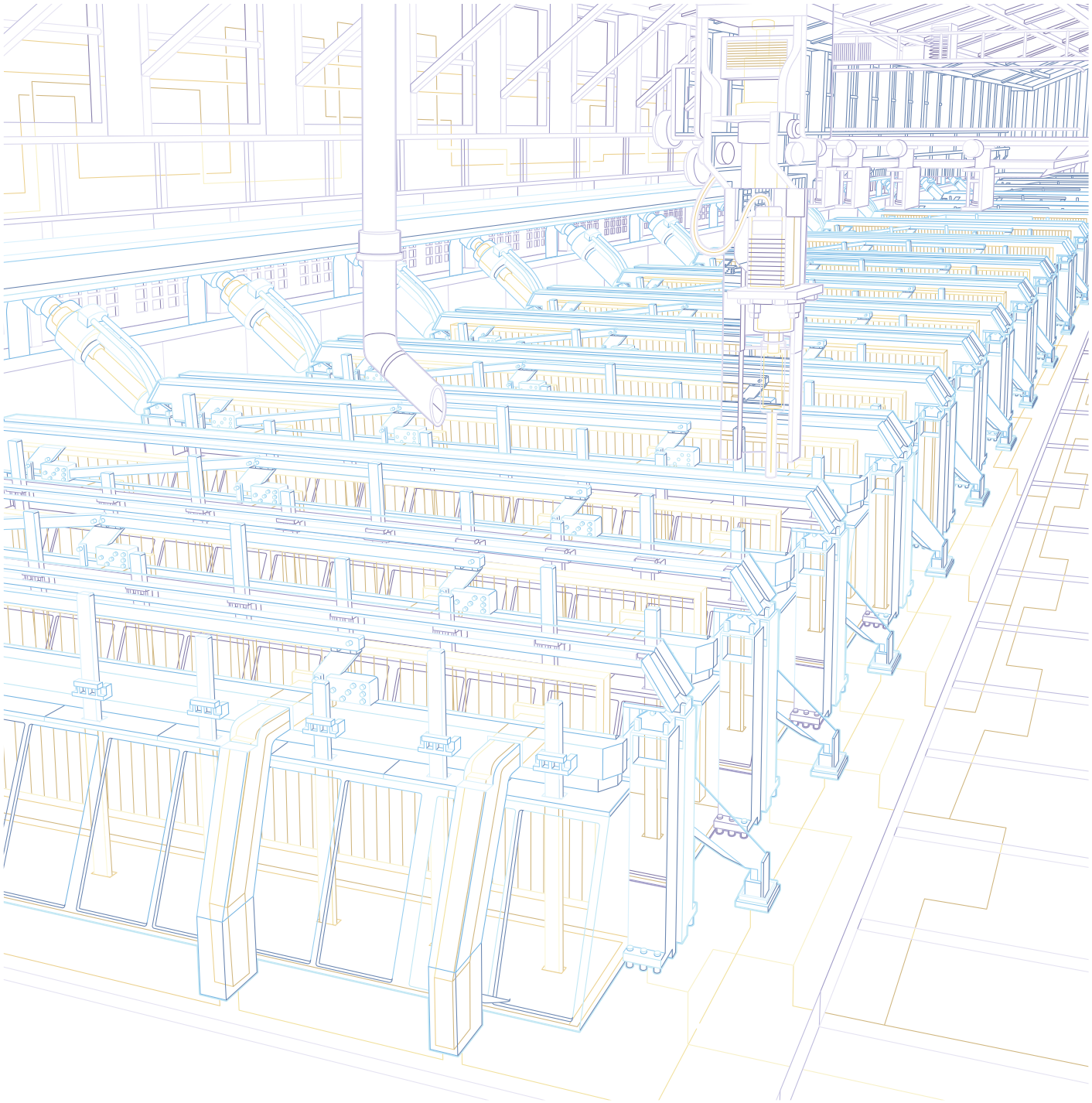


B mini contactors
K mini contactor relays

With screw terminals

3-pole contactors

B6, B7 — AC operated — **3**/2

BC6, BC7, B7D — DC operated — **3**/3

3-pole reversing contactors

VB6, VB7 — AC operated — **3**/4

VBC6, VBC7 — DC operated — **3**/5

3-pole interface contactors

BC6, BC7 — DC operated — **3**/6

3-pole contactors - large coil voltage range

TBC7 — DC operated — **3**/7

4-pole contactors

B6, B7 — AC operated — **3**/8

BC6, BC7 — DC operated — **3**/9

4-pole contactors - large coil voltage range

TBC7 — DC operated — **3**/10

Contactor relays

K6 — AC operated — **3**/12

KC6 — DC operated — **3**/13

Interface contactor relays

KC6 — DC operated — **3**/14

Contactor relays - large coil voltage range

TKC6 — DC operated — **3**/15

With soldering pins

3-pole contactors

B6, B7 — AC operated — **3**/16

BC6, BC7 — DC operated — **3**/17

3-pole reversing contactors

VB6, VB7 — AC operated — **3**/18

VBC6, VBC7 — DC operated — **3**/19

Contactor relays

K6 — AC operated — **3**/20

KC6 — DC operated — **3**/21

3-pole interface contactors

BC6, BC7 — DC operated — **3**/22

Interface contactors relays

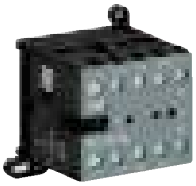
KC6 — DC operated — **3**/23

Accessories — **3/24**

Technical data — **3/26**

B6, B7 3-pole mini contactors – with screw terminals
4 to 5.5 kW
AC operated

B6-30-10



B7-30-10

3

Description

B6, B7 3-pole mini contactors are compact control products mainly used for switching resistive or motor loads up to 690 V AC.

These contactors are designed with:

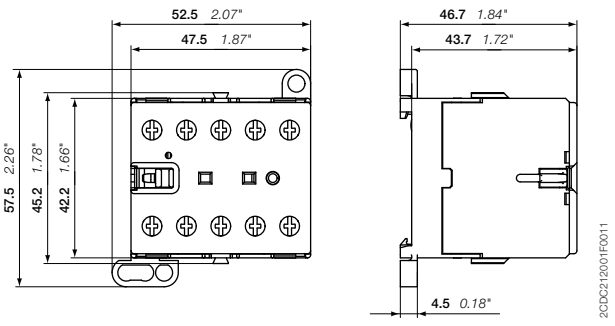
– 3 main poles and one built-in auxiliary contact
– control circuit: AC operated, low coil consumption (3.5 VA at pull-in and at holding)
– add-on auxiliary contact blocks for front or side mounting and a wide range of accessories
– hum-free coil
– designed for rail or wall mounting

Ordering details

IEC		UL/CSA		Rated control circuit voltage U_C		Auxiliary contacts fitted		Type	Order code		Pkg qty	Weight (1 pce)
Rated operational power 400 V AC-3	current θ ≤ 55 °C AC-1	3-phase motor rating 480 V	General use rating 600 V AC	50 Hz	60 Hz							
kW	A	hp	A	V AC	V AC							kg
B6 mini contactors												
4	16	3	3.4	24	24	1	0	B6-30-10-01	GJL1211001R0101		10	0.175
						0	1	B6-30-01-01	GJL1211001R0011		10	0.175
				42	42	1	0	B6-30-10-02	GJL1211001R0102		10	0.175
						0	1	B6-30-01-02	GJL1211001R0012		10	0.175
				48	48	1	0	B6-30-10-03	GJL1211001R0103		10	0.175
						0	1	B6-30-01-03	GJL1211001R0013		10	0.175
				110 ... 127	110 ... 127	1	0	B6-30-10-84	GJL1211001R8104		10	0.175
						0	1	B6-30-01-84	GJL1211001R8014		10	0.175
				220 ... 240	220 ... 240	1	0	B6-30-10-80	GJL1211001R8100		10	0.175
						0	1	B6-30-01-80	GJL1211001R8010		10	0.175
				380 ... 415	380 ... 415	1	0	B6-30-10-85	GJL1211001R8105		10	0.175
						0	1	B6-30-01-85	GJL1211001R8015		10	0.175
B7 mini contactors												
5.5	20	5	7.6	24	24	1	0	B7-30-10-01	GJL1311001R0101		10	0.175
						0	1	B7-30-01-01	GJL1311001R0011		10	0.175
				42	42	1	0	B7-30-10-02	GJL1311001R0102		10	0.175
						0	1	B7-30-01-02	GJL1311001R0012		10	0.175
				48	48	1	0	B7-30-10-03	GJL1311001R0103		10	0.175
						0	1	B7-30-01-03	GJL1311001R0013		10	0.175
				110 ... 127	110 ... 127	1	0	B7-30-10-84	GJL1311001R8104		10	0.175
						0	1	B7-30-01-84	GJL1311001R8014		10	0.175
				220 ... 240	220 ... 240	1	0	B7-30-10-80	GJL1311001R8100		10	0.175
						0	1	B7-30-01-80	GJL1311001R8010		10	0.175
				380 ... 415	380 ... 415	1	0	B7-30-10-85	GJL1311001R8105		10	0.175
						0	1	B7-30-01-85	GJL1311001R8015		10	0.175

Other types on request

Main dimensions mm, *inches*



B6, B7

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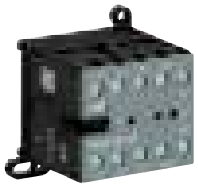
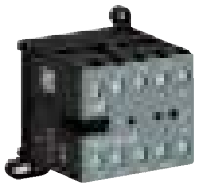
BC6, BC7, B7D 3-pole mini contactors – with screw terminals
4 to 5.5 kW
DC operated



BC6-30-10



BC7-30-10

Description

BC6, BC7, B7D 3-pole mini contactors are compact control products mainly used for switching resistive or motor loads up to 690 V AC.

These contactors are designed with:

- 3 main poles and one built-in auxiliary contact
- control circuit: DC operated, low consumption (3.5 W at pull-in and at holding)
- hum-free coil
- add-on auxiliary contact blocks for front or side mounting and a wide range of accessories
- designed for rail or wall mounting

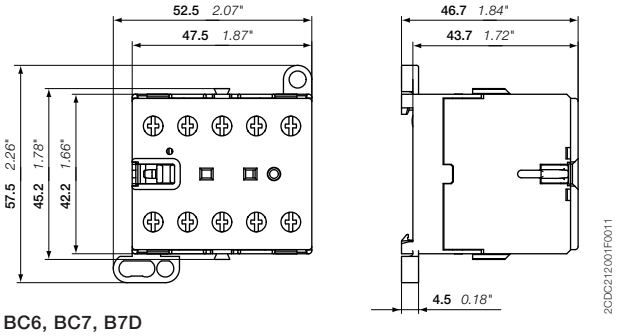
3

Ordering details

IEC		UL/CSA		Rated control circuit voltage U_c	Auxiliary contacts fitted	Type	Order code		Pkg qty	Weight (1 pce)
Rated operational power 400 V AC-3 kW	current θ ≤ 55 °C AC-1 A	3-phase motor rating 480 V hp	General use rating 600 V AC A	V DC						kg
BC6 mini contactors										
4	16	3	3.4	12	1 0	BC6-30-10-07	GJL1213001R0107		10	0.175
					0 1	BC6-30-01-07	GJL1213001R0017		10	0.175
				24	1 0	BC6-30-10-01	GJL1213001R0101		10	0.175
					0 1	BC6-30-01-01	GJL1213001R0011		10	0.175
				48	1 0	BC6-30-10-16	GJL1213001R1106		10	0.175
					0 1	BC6-30-01-16	GJL1213001R1016		10	0.175
				60	1 0	BC6-30-10-03	GJL1213001R0103		10	0.175
					0 1	BC6-30-01-03	GJL1213001R0013		10	0.175
				110 ... 125	1 0	BC6-30-10-04	GJL1213001R0104		10	0.175
					0 1	BC6-30-01-04	GJL1213001R0014		10	0.175
				220 ... 240	1 0	BC6-30-10-05	GJL1213001R0105		10	0.175
					0 1	BC6-30-01-05	GJL1213001R0015		10	0.175
BC7 mini contactors										
5.5	20	5	7.6	12	1 0	BC7-30-10-07	GJL1313001R0107		10	0.175
					0 1	BC7-30-01-07	GJL1313001R0017		10	0.175
				24	1 0	BC7-30-10-01	GJL1313001R0101		10	0.175
					0 1	BC7-30-01-01	GJL1313001R0011		10	0.175
				48	1 0	BC7-30-10-16	GJL1313001R1106		10	0.175
					0 1	BC7-30-01-16	GJL1313001R1016		10	0.175
				60	1 0	BC7-30-10-03	GJL1313001R1103		10	0.175
					0 1	BC7-30-01-03	GJL1313001R0013		10	0.175
				110 ... 125	1 0	BC7-30-10-04	GJL1313001R0104		10	0.175
					0 1	BC7-30-01-04	GJL1313001R0014		10	0.175
				220 ... 240	1 0	BC7-30-10-05	GJL1313001R0105		10	0.175
					0 1	BC7-30-01-05	GJL1313001R0015		10	0.175
B7D mini contactors with integrated suppressor diode										
5.5	20	5	7.6	24	1 0	B7D-30-10-01	GJL1317001R0101		10	0.175
					0 1	B7D-30-01-01	GJL1317001R0011		10	0.175
				220	1 0	B7D-30-10-05	GJL1317001R0105		10	0.175
					0 1	B7D-30-01-05	GJL1317001R0015		10	0.175

Other types on request

Main dimensions mm, *inches*



BC6, BC7, B7D

VB6, VB7 3-pole mini reversing contactors – with screw terminals
4 to 5.5 kW
AC operated

VB7-30-10

3

Description

VB6, VB7 3-pole compact design reversing contactors are space optimized control products mainly used for switching resistive or motor loads up to 690 V AC.

These reversing contactors are designed with:

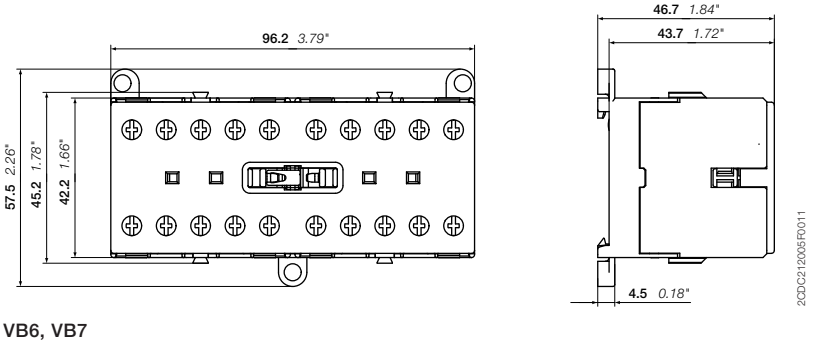
- built-in mechanical interlock. The coils must be mutually interlocked electrically and coils must be de-energised for 50 ms at least to prevent phase to phase short circuit on the arc.
- control circuit: AC operated, low coil consumption (3.5 VA at pull-in and at holding)
- hum-free coil
- add-on auxiliary contact blocks for front mounting
- designed for rail or wall mounting

Ordering details

IEC		UL/CSA		Rated control circuit voltage U_c		Auxiliary contacts fitted		Type	Order code		Pkg qty	Weight (1 pce)
Rated operational power 400 V AC-3	current θ ≤ 55 °C AC-1	3-phase motor rating 480 V	General use rating 600 V AC	50 Hz	60 Hz							
kW	A	hp	A	V AC	V AC							kg
VB6 mini reversing contactors												
4	16	3	3.4	24	24	1	0	VB6-30-10-01	GJL1211901R0101		5	0.355
						0	1	VB6-30-01-01	GJL1211901R0011		5	0.355
				42	42	1	0	VB6-30-10-02	GJL1211901R0102		5	0.355
						0	1	VB6-30-01-02	GJL1211901R0012		5	0.355
				48	48	1	0	VB6-30-10-03	GJL1211901R0103		5	0.355
						0	1	VB6-30-01-03	GJL1211901R0013		5	0.355
				110 ... 127	110 ... 127	1	0	VB6-30-10-84	GJL1211901R8104		5	0.355
						0	1	VB6-30-01-84	GJL1211901R8014		5	0.355
				220 ... 240	220 ... 240	1	0	VB6-30-10-80	GJL1211901R8100		5	0.355
						0	1	VB6-30-01-80	GJL1211901R8010		5	0.355
				380 ... 415	380 ... 415	1	0	VB6-30-10-85	GJL1211901R8105		5	0.355
						0	1	VB6-30-01-85	GJL1211901R8015		5	0.355
VB7 mini reversing contactors												
5.5	20	5	7.6	24	24	1	0	VB7-30-10-01	GJL1311901R0101		5	0.355
						0	1	VB7-30-01-01	GJL1311901R0011		5	0.355
				42	42	1	0	VB7-30-10-02	GJL1311901R0102		5	0.355
						0	1	VB7-30-01-02	GJL1311901R0012		5	0.355
				48	48	1	0	VB7-30-10-03	GJL1311901R0103		5	0.355
						0	1	VB7-30-01-03	GJL1311901R0013		5	0.355
				110 ... 127	110 ... 127	1	0	VB7-30-10-84	GJL1311901R8104		5	0.355
						0	1	VB7-30-01-84	GJL1311901R8014		5	0.355
				220 ... 240	220 ... 240	1	0	VB7-30-10-80	GJL1311901R8100		5	0.355
						0	1	VB7-30-01-80	GJL1311901R8010		5	0.355
				380 ... 415	380 ... 415	1	0	VB7-30-10-85	GJL1311901R8105		5	0.355
						0	1	VB7-30-01-85	GJL1311901R8015		5	0.355

Other types on request

Main dimensions mm, *inches*



VB6, VB7

2CDC102016C0201

VBC6, VBC7 3-pole mini reversing contactors – with screw terminals
4 to 5.5 kW
DC operated

VBC6-30-10

VBC7-30-10

Description

VBC6, VBC7 3-pole compact design reversing contactors are space optimized control products mainly used for switching resistive or motor loads up to 690 V AC.

These reversing contactors are designed with:

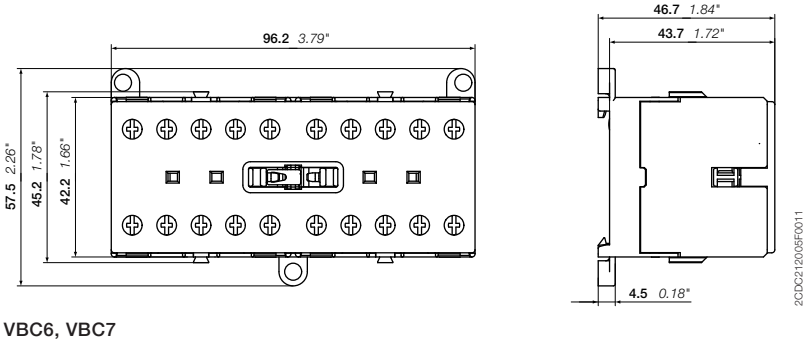
- built-in mechanical interlock. The coils must be mutually interlocked electrically and coils must be de-energised for 50 ms at least to prevent phase to phase short circuit on the arc.
- control circuit: DC operated, low coil consumption (3.5 W at pull-in and at holding)
- hum-free coil
- add-on auxiliary contact blocks for front mounting
- designed for rail or wall mounting

Ordering details

IEC		UL/CSA		Rated control circuit voltage U_c	Auxiliary contacts fitted	Type	Order code		Pkg qty	Weight (1 pce)
Rated operational power 400 V AC-3	current θ ≤ 55 °C AC-1	3-phase motor rating 480 V	General use rating 600 V AC							
kW	A	hp	A	V DC						kg
VBC6 mini reversing contactors										
4	16	3	3.4	12	1 0	VBC6-30-10-07	GJL1213901R0107		5	0.355
					0 1	VBC6-30-01-07	GJL1213901R0017		5	0.355
				24	1 0	VBC6-30-10-01	GJL1213901R0101		5	0.355
					0 1	VBC6-30-01-01	GJL1213901R0011		5	0.355
				48	1 0	VBC6-30-10-16	GJL1213901R1106		5	0.355
					0 1	VBC6-30-01-16	GJL1213901R1016		5	0.355
				60	1 0	VBC6-30-10-03	GJL1213901R0103		5	0.355
					0 1	VBC6-30-01-03	GJL1213901R0013		5	0.355
				110 ... 125	1 0	VBC6-30-10-04	GJL1213901R0104		5	0.355
					0 1	VBC6-30-01-04	GJL1213901R0014		5	0.355
				220 ... 240	1 0	VBC6-30-10-05	GJL1213901R0105		5	0.355
					0 1	VBC6-30-01-05	GJL1213901R0015		5	0.355
VBC7 mini reversing contactors										
5.5	20	5	7.6	12	1 0	VBC7-30-10-07	GJL1313901R0107		5	0.355
					0 1	VBC7-30-01-07	GJL1313901R0017		5	0.355
				24	1 0	VBC7-30-10-01	GJL1313901R0101		5	0.355
					0 1	VBC7-30-01-01	GJL1313901R0011		5	0.355
				48	1 0	VBC7-30-10-16	GJL1313901R1106		5	0.355
					0 1	VBC7-30-01-16	GJL1313901R1016		5	0.355
				60	1 0	VBC7-30-10-03	GJL1313901R0103		5	0.355
					0 1	VBC7-30-01-03	GJL1313901R0013		5	0.355
				110 ... 125	1 0	VBC7-30-10-04	GJL1313901R0104		5	0.355
					0 1	VBC7-30-01-04	GJL1313901R0014		5	0.355
				220 ... 240	1 0	VBC7-30-10-05	GJL1313901R0105		5	0.355
					0 1	VBC7-30-01-05	GJL1313901R0015		5	0.355

Other types on request

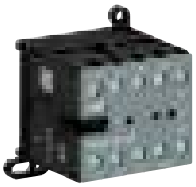
Main dimensions mm, *inches*



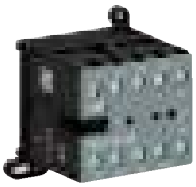
VBC6, VBC7

2CDC102017C0201

BC6, BC7 3-pole interface mini contactors – with screw terminals
4 to 5.5 kW
DC operated



BC6-30-10



BC7-30-10

3

Description

BC6, BC7 3-pole interface mini contactors are compact control products mainly used for switching resistive or motor loads up to 690 V AC.

These contactors are designed with:

- 3 main poles and one built-in auxiliary contact
- control circuit: DC operated, very low coil consumption. Suitable for direct control by PLC outputs
- hum-free coil
- no auxiliary contact block permitted for mounting
- designed for rail or wall mounting

Ordering details

IEC		UL/CSA		Rated control circuit voltage U_c	Auxiliary contacts fitted	Type	Order code		Pkg qty	Weight (1 pce)
Rated operational power 400 V AC-3 kW	current θ ≤ 55 °C AC-1 A	3-phase motor rating 480 V hp	General use rating 600 V AC A	V DC						kg
DC operation 24 V / 1.4 W										
4	16	3	3.4	24	1 0	BC6-30-10-1.4-81	GJL1213001R8101		10	0.175
					0 1	BC6-30-01-1.4-81	GJL1213001R8011		10	0.175
5.5	20	5	7.6	24	1 0	BC7-30-10-1.4-81	GJL1313001R8101		10	0.175
					0 1	BC7-30-01-1.4-81	GJL1313001R8011		10	0.175
DC operation 17 ... 32 V / 2.4 W										
4	16	3	3.4	17 ... 32 (1)	1 0	BC6-30-10-2.4-51	GJL1213001R5101		10	0.175
					0 1	BC6-30-01-2.4-51	GJL1213001R5011		10	0.175
5.5	20	5	7.6	17 ... 32 (1)	1 0	BC7-30-10-2.4-51	GJL1313001R5101		10	0.175
					0 1	BC7-30-01-2.4-51	GJL1313001R5011		10	0.175

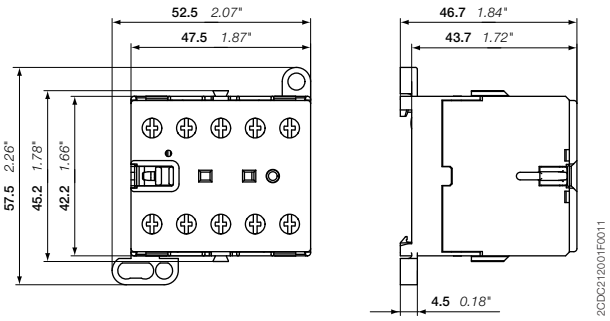
Connection to PLCs with integrated protective circuit

DC operation 24 V / 1.7 W										
4	16	3	3.4	24	1 0	B6S-30-10-1.7-71	GJL1213001R7101		10	0.175
					0 1	B6S-30-01-1.7-71	GJL1213001R7011		10	0.175
5.5	20	5	7.6	24	1 0	B7S-30-10-1.7-71	GJL1313001R7101		10	0.175
					0 1	B7S-30-01-1.7-71	GJL1313001R7011		10	0.175
DC operation 17 ... 32 V / 2.8 W										
4	16	3	3.4	17 ... 32 (1)	1 0	B6S-30-10-2.8-72	GJL1213001R7102		10	0.175
					0 1	B6S-30-01-2.8-72	GJL1213001R7012		10	0.175
5.5	20	5	7.6	17 ... 32 (1)	1 0	B7S-30-10-2.8-72	GJL1313001R7102		10	0.175
					0 1	B7S-30-01-2.8-72	GJL1313001R7012		10	0.175

Other types on request

(1) Uc min. and Uc max. limit values, including the voltage variation tolerances (-15 % and +10 %).

Main dimensions mm, *inches*



BC6, BC7

2CDC102010C0201

TBC7 3-pole mini contactors – with screw terminals
4 to 5.5 kW
DC operated – large coil voltage range

TBC7-30-10

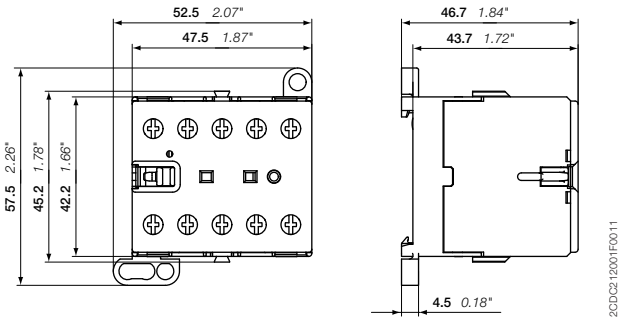
Description
TBC7 3-pole mini contactors are compact control products mainly used for switching resistive or motor loads up to 690 V AC.
These contactors are designed with:
- 3 main poles and one built-in auxiliary contact
- control circuit: DC operated, low coil consumption (5 W at pull-in and at holding)
- hum-free coil
- expanded ambient temperature range -30 … +70 °C and wide range voltage supply
- no auxiliary contact block permitted for mounting
- designed for rail or wall mounting
- material is approved for railway applications

Ordering details

IEC		UL/CSA		Rated control circuit voltage U_{Cmin} ... U_{Cmax} (1)	Auxiliary contacts fitted	Type	Order code		Pkg qty	Weight (1 pce)
Rated operational power 400 V AC-3	current θ ≤ 55 °C AC-1	3-phase motor rating 480 V	General use rating 600 V AC							
kW	A	hp	A	V DC						kg
TBC7 mini contactors										
5.5	20	5	7.6	17 ... 32	1 0	TBC7-30-10-51	GJL1313061R5101		10	0.185
					0 1	TBC7-30-01-51	GJL1313061R5011		10	0.185
				50 ... 90	1 0	TBC7-30-10-55	GJL1313061R5105		10	0.185
					0 1	TBC7-30-01-55	GJL1313061R5015		10	0.185
				77 ... 143	1 0	TBC7-30-10-62	GJL1313061R6102		10	0.185
					0 1	TBC7-30-01-62	GJL1313061R6012		10	0.185
				140 ... 260	1 0	TBC7-30-10-68	GJL1313061R6108		10	0.185
					0 1	TBC7-30-01-68	GJL1313061R6018		10	0.185

Other types on request
(1) Uc min. and Uc max. limit values, including the voltage variation tolerances (-15 % and +10 %).

Main dimensions mm, *inches*



TBC7

B6, B7 4-pole mini contactors – with screw terminals
4 to 5.5 kW
AC operated

B6-22-00

3

Description

B6, B7 4-pole mini contactors are compact control products mainly used for switching resistive loads up to 690 V AC.

These contactors are designed with:

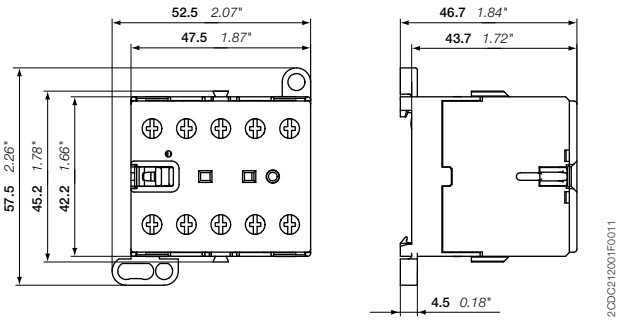
– 4 main poles
– control circuit: AC operated, low coil consumption (3.5 VA at pull-in and at holding)
– add-on auxiliary contact blocks for front or side mounting and a wide range of accessories
– hum-free coil
– designed for rail or wall mounting

Ordering details

IEC Rated operational current θ ≤ 55 °C AC-1 A	UL/CSA General use rating 600 V AC A	Rated control circuit voltage U_c 50/60 HZ V AC	Auxiliary contacts fitted	Type	Order code		Pkg qty	Weight (1 pce) kg
4 N.O. main poles								
16	8.4	24	0 0	B6-40-00-01	GJL1211201R0001		10	0.175
		42	0 0	B6-40-00-02	GJL1211201R0002		10	0.175
		48	0 0	B6-40-00-03	GJL1211201R0003		10	0.175
		110 ... 127	0 0	B6-40-00-84	GJL1211201R8004		10	0.175
		220 ... 240	0 0	B6-40-00-80	GJL1211201R8000		10	0.175
20	13.8	24	0 0	B7-40-00-01	GJL1311201R0001		10	0.175
		42	0 0	B7-40-00-02	GJL1311201R0002		10	0.175
		48	0 0	B7-40-00-03	GJL1311201R0003		10	0.175
		110 ... 127	0 0	B7-40-00-84	GJL1311201R8004		10	0.175
		220 ... 240	0 0	B7-40-00-80	GJL1311201R8000		10	0.175
2 N.O. + 2 N.C. main poles								
16	8.4	24	0 0	B6-22-00-01	GJL1211501R0001		10	0.175
		42	0 0	B6-22-00-02	GJL1211501R0002		10	0.175
		48	0 0	B6-22-00-03	GJL1211501R0003		10	0.175
		110 ... 127	0 0	B6-22-00-84	GJL1211501R8004		10	0.175
		220 ... 240	0 0	B6-22-00-80	GJL1211501R8000		10	0.175
20	13.8	24	0 0	B7-22-00-01	GJL1311501R0001		10	0.175
		42	0 0	B7-22-00-02	GJL1311501R0002		10	0.175
		48	0 0	B7-22-00-03	GJL1311501R0003		10	0.175
		110 ... 127	0 0	B7-22-00-84	GJL1311501R8004		10	0.175
		220 ... 240	0 0	B7-22-00-80	GJL1311501R8000		10	0.175

Other types on request

Main dimensions mm, *inches*



B6, B7

2CDC102009C0201

BC6, B7D 4-pole mini contactors – with screw terminals
4 to 5.5 kW
DC operated

BC6-22-00

Description
BC6, B7D 4-pole mini contactors are compact control products mainly used for switching resistive loads up to 690 V AC.

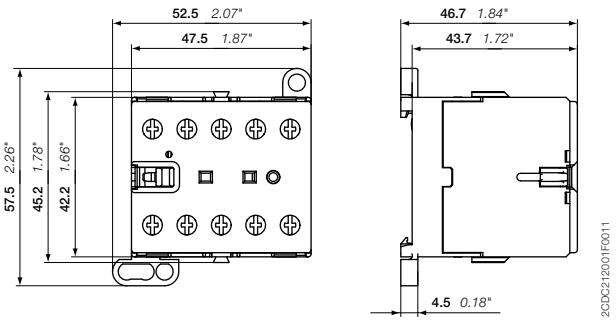
These contactors are designed with:
- 4 main poles
- control circuit: DC operated, low coil consumption (3.5 W at pull-in and at holding)
- hum-free coil
- add-on auxiliary contact blocks for front or side mounting
- designed for rail or wall mounting

Ordering details

IEC Rated operational current θ ≤ 55 °C AC-1 A	UL/CSA General use rating 600 V AC A	Rated control circuit voltage U_c V DC	Auxiliary contacts fitted	Type	Order code		Pkg qty	Weight (1 pce) kg
4 N.O. main poles								
20	13.8	24	0 0	B7D-40-00-01	GJL1317201R0001		10	0.175
		220	0 0	B7D-40-00-05	GJL1317201R0005		10	0.175
2 N.O. + 2 N.C. main poles								
16	8.4	12	0 0	BC6-22-00-07	GJL1213501R0007		10	0.175
		24	0 0	BC6-22-00-01	GJL1213501R0001		10	0.175
		42	0 0	BC6-22-00-02	GJL1213501R0002		10	0.175
		48	0 0	BC6-22-00-16	GJL1213501R1006		10	0.175
		60	0 0	BC6-22-00-03	GJL1213501R0003		10	0.175
		110 ... 125	0 0	BC6-22-00-04	GJL1213501R0004		10	0.175
		220 ... 240	0 0	BC6-22-00-05	GJL1213501R0005		10	0.175

Other types on request

Main dimensions mm, *inches*



BC6, B7D

TBC7 4-pole mini contactors – with screw terminals
4 to 5.5 kW
DC operated – large coil voltage range

TBC7-31-00

Description

TBC7 4-pole mini contactors are compact control products mainly used for switching resistive or motor loads up to 690 V AC.

These contactors are designed with:

- 4 main poles
- control circuit: DC operated, low coil consumption (5 W at pull-in and at holding)
- hum-free coil
- expanded ambient temperature range -30 … +70 °C and wide range voltage supply
- no auxiliary contact block permitted for mounting
- designed for rail or wall mounting
- material is approved for railway applications

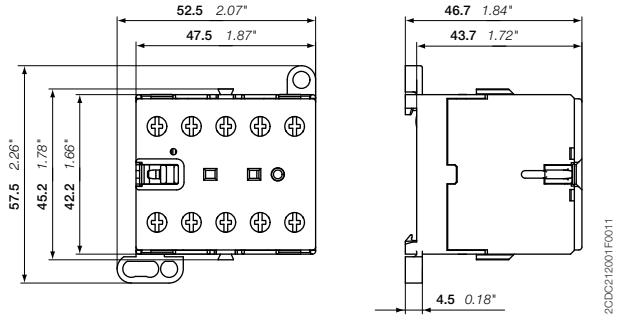
Ordering details

IEC Rated operational current θ ≤ 55 °C AC-1 A	UL/CSA General use rating 600 V AC A	Rated control circuit voltage $U_{C\,min}$ ... $U_{C\,max}$ (1) V DC	Auxiliary contacts fitted	Type	Order code		Pkg qty	Weight (1 pce) kg
3 N.O. + 1 N.C. main poles								
5.5	20	50 ... 90	0 0	TBC7-31-00-55	GJL1313461R5005		10	0.185
		77 ... 143	0 0	TBC7-31-00-62	GJL1313461R6002		10	0.185
		140 ... 260	0 0	TBC7-31-00-68	GJL1313461R6008		10	0.185
2 N.O. + 2 N.C. main poles								
5.5	20	50 ... 90	0 0	TBC7-22-00-55	GJL1313561R5005		10	0.185
		77 ... 143	0 0	TBC7-22-00-62	GJL1313561R6002		10	0.185
		140 ... 260	0 0	TBC7-22-00-68	GJL1313561R6008		10	0.185

Other types on request

(1) Uc min. and Uc max. limit values, including the voltage variation tolerances (-15 % and +10 %).

Main dimensions mm, *inches*



TBC7

2CDC102022C0201

Notes

K6 4-pole mini contactor relays – with screw terminals
AC operated

K6-22Z

K6-31Z

3

Description

K6 4-pole mini contactor relays are space optimized control products mainly used for control functions or for small loads up to 4 A.

These contactors are designed with:

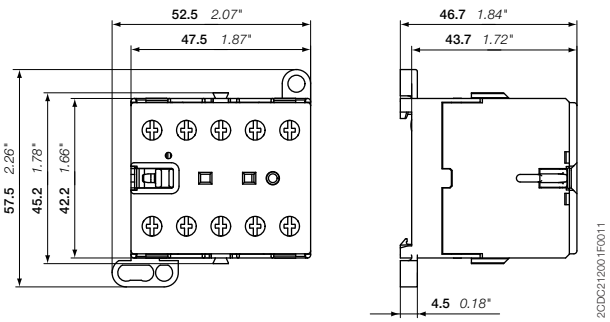
- 4 poles with various contact combinations
- control circuit: AC operated, low coil consumption (3.5 VA at pull-in and at holding)
- hum-free coil
- add-on auxiliary contact blocks for front or side mounting
- designed for rail or wall mounting

Ordering details

Rated control circuit voltage U_c		Auxiliary contacts fitted	Type	Order code		Pkg qty	Weight (1 pce)
50 Hz V AC	60 Hz V AC						kg
K6 4-pole mini contactor relays							
24	24	2 2	K6-22Z-01	GJH1211001R0221		10	0.175
42	42	2 2	K6-22Z-02	GJH1211001R0222		10	0.175
48	48	2 2	K6-22Z-03	GJH1211001R0223		10	0.175
110 ...127	110 ...127	2 2	K6-22Z-84	GJH1211001R8224		10	0.175
220 ... 240	220 ... 240	2 2	K6-22Z-80	GJH1211001R8220		10	0.175
380 ... 415	380 ... 415	2 2	K6-22Z-85	GJH1211001R8225		10	0.175
24	24	3 1	K6-31Z-01	GJH1211001R0311		10	0.175
42	42	3 1	K6-31Z-02	GJH1211001R0312		10	0.175
48	48	3 1	K6-31Z-03	GJH1211001R0313		10	0.175
110 ...127	110 ...127	3 1	K6-31Z-84	GJH1211001R8314		10	0.175
220 ... 240	220 ... 240	3 1	K6-31Z-80	GJH1211001R8310		10	0.175
380 ... 415	380 ... 415	3 1	K6-31Z-85	GJH1211001R8315		10	0.175
24	24	4 0	K6-40E-01	GJH1211001R0401		10	0.175
42	42	4 0	K6-40E-02	GJH1211001R0402		10	0.175
48	48	4 0	K6-40E-03	GJH1211001R0403		10	0.175
110 ...127	110 ...127	4 0	K6-40E-84	GJH1211001R8404		10	0.175
220 ... 240	220 ... 240	4 0	K6-40E-80	GJH1211001R8400		10	0.175
380 ... 415	380 ... 415	4 0	K6-40E-85	GJH1211001R8405		10	0.175

Other types on request

Main dimensions mm, *inches*



K6

2CDC102011C0201

KC6 4-pole mini contactor relays – with screw terminals
DC operated

KC6-22Z

Description

KC6 4-pole mini contactor relays are space optimized control products mainly used for control functions or for small loads up to 4 A.

These contactors are designed with:

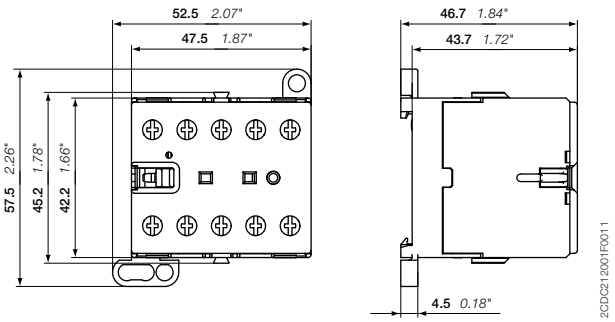
– 4 poles with various contact combinations
– control circuit: DC operated, low coil consumption (3.5 W at pull-in and at holding)
– hum-free coil
– add-on auxiliary contact blocks for front or side mounting
– designed for rail or wall mounting

Ordering details

Rated control circuit voltage U_c	Auxiliary contacts fitted	Type	Order code		Pkg qty	Weight (1 pce)
V DC						kg
KC6 4-pole mini contactor relays						
12	2 2	KC6-22Z-07	GJH1213001R0227		10	0.175
24	2 2	KC6-22Z-01	GJH1213001R0221		10	0.175
48	2 2	KC6-22Z-16	GJH1213001R1226		10	0.175
60	2 2	KC6-22Z-13	GJH1213001R1223		10	0.175
110 ... 125	2 2	KC6-22Z-04	GJH1213001R0224		10	0.175
220 ... 240	2 2	KC6-22Z-05	GJH1213001R0225		10	0.175
12	3 1	KC6-31Z-07	GJH1213001R0317		10	0.175
24	3 1	KC6-31Z-01	GJH1213001R0311		10	0.175
48	3 1	KC6-31Z-16	GJH1213001R1316		10	0.175
60	3 1	KC6-31Z-13	GJH1213001R1313		10	0.175
110 ... 125	3 1	KC6-31Z-04	GJH1213001R0314		10	0.175
220 ... 240	3 1	KC6-31Z-05	GJH1213001R0315		10	0.175
12	4 0	KC6-40E-07	GJH1213001R0407		10	0.175
24	4 0	KC6-40E-01	GJH1213001R0401		10	0.175
48	4 0	KC6-40E-16	GJH1213001R1406		10	0.175
60	4 0	KC6-40E-13	GJH1213001R1403		10	0.175
110 ... 125	4 0	KC6-40E-04	GJH1213001R0404		10	0.175
220 ... 240	4 0	KC6-40E-05	GJH1213001R0405		10	0.175

Other types on request

Main dimensions mm, *inches*



KC6

KC6 4-pole interface mini contactor relays – with screw terminals
DC operated

KC6-31Z

3

Description

KC6 4-pole interface mini contactor relays are space optimized control products mainly used for control functions or for small loads up to 4 A.

These contactors are designed with:

- 4 poles with various contact combinations
- control circuit: DC operated, low coil consumption (1.4 ... 2.8 W at pull-in and at holding)
- hum-free coil
- no auxiliary contact block permitted for mounting
- designed for rail or wall mounting

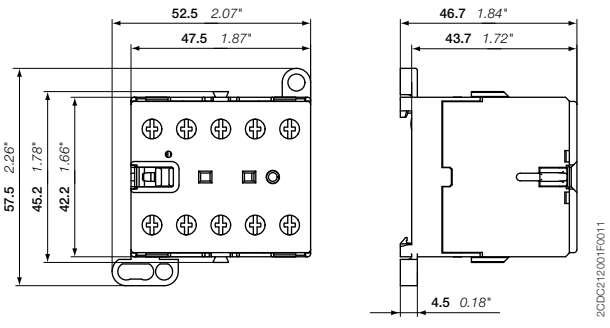
Ordering details

Rated control circuit voltage U_c	Auxiliary contacts fitted		Type	Order code		Pkg qty	Weight (1 pce)
V DC							kg
DC operation 24 V / 1.4 W							
24	3	1	KC6-31Z-1.4-81	GJH1213001R8311		10	0.175
24	4	0	KC6-40E-1.4-81	GJH1213001R8401		10	0.175
DC operation 17 ... 32 V / 2.4 W							
17 ... 32 (1)	3	1	KC6-31Z-2.4-51	GJH1213001R5311		10	0.175
17 ... 32 (1)	4	0	KC6-40E-2.4-51	GJH1213001R5401		10	0.175
DC operation 24 V / 1.7 W							
24	2	2	K6S-22Z-1.7-71	GJH1213001R7221		10	0.175
24	3	1	K6S-31Z-1.7-71	GJH1213001R7311		10	0.175
24	4	0	K6S-40E-1.7-71	GJH1213001R7401		10	0.175
DC operation 17 ... 32 V / 2.8 W							
17 ... 32 (1)	2	2	K6S-22Z-2.8-72	GJH1213001R7222		10	0.175
17 ... 32 (1)	3	1	K6S-31Z-2.8-72	GJH1213001R7312		10	0.175
17 ... 32 (1)	4	0	K6S-40E-2.8-72	GJH1213001R7402		10	0.175

Other types on request

(1) Uc min. and Uc max. limit values, including the voltage variation tolerances (-15 % and +10 %).

Main dimensions mm, *inches*



KC6

2CDC102013C0201

TKC6 4-pole mini contactor relays – with screw terminals
DC operated – large coil voltage range

TKC6-31Z

Description

TKC6 4-pole mini contactors are space optimized control products mainly used for control functions or for small loads up to 4 A.

These contactors are designed with:

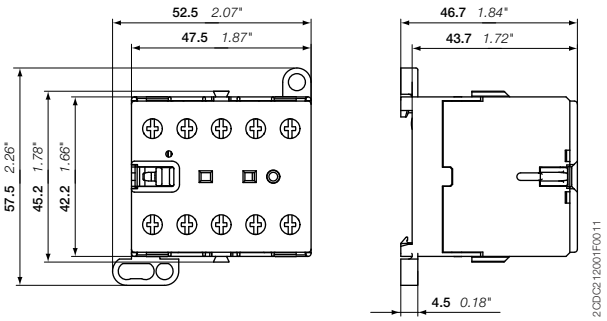
– 4 poles with various contact combinations
– control circuit: DC operated, hum free, low consumption (5 W at pull-in and at holding)
– expanded ambient temperature range -30 … +70 °C and wide range voltage supply
– material is suitable for railway applications
– humfree operating DC coil
– no auxiliary contact block permitted for mounting
– designed for rail or wall mounting

Ordering details

Rated control circuit voltage $U_{C\,min}$ ... $U_{C\,max}$ (1) V DC	Auxiliary contacts fitted	Type	Order code		Pkg qty	Weight (1 pce) kg
17 ... 32	2 2	TKC6-22Z-51	GJH1213061R5221		10	0.180
50 ... 90	2 2	TKC6-22Z-55	GJH1213061R5225		10	0.180
77 ... 143	2 2	TKC6-22Z-62	GJH1213061R6222		10	0.180
140 ... 260	2 2	TKC6-22Z-68	GJH1213061R6228		10	0.180
17 ... 32	3 1	TKC6-31Z-51	GJH1213061R5311		10	0.180
50 ... 90	3 1	TKC6-31Z-55	GJH1213061R5315		10	0.180
77 ... 143	3 1	TKC6-31Z-62	GJH1213061R6312		10	0.180
140 ... 260	3 1	TKC6-31Z-68	GJH1213061R6318		10	0.180
17 ... 32	4 0	TKC6-40E-51	GJH1213061R5401		10	0.180
50 ... 90	4 0	TKC6-40E-55	GJH1213061R5405		10	0.180
77 ... 143	4 0	TKC6-40E-62	GJH1213061R6402		10	0.180
140 ... 260	4 0	TKC6-40E-68	GJH1213061R6408		10	0.180

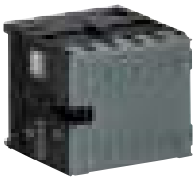
Other types on request
(1) Uc min. and Uc max. limit values, including the voltage variation tolerances (-15 % and +10 %).

Main dimensions mm, *inches*



TKC6

B6, B7 3-pole mini contactors – with soldering pins
4 to 5.5 kW
AC operated



B6-30-10-P

B7-30-10-P

Description

B6..P and B7..P 3-pole mini contactors are compact control products mainly used for switching resistive or motor loads up to 690 V AC.

These contactors are designed with:

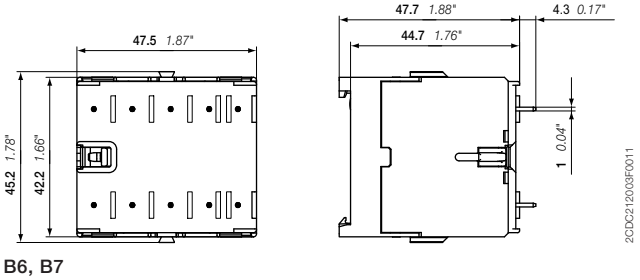
- 3 main poles and one built-in auxiliary contact
- control circuit: AC operated, low coil consumption (3.5 VA at pull-in and at holding)
- hum-free coil
- add-on auxiliary contact blocks for side mounting
- designed for soldering on PCB boards

Ordering details

IEC		UL/CSA		Rated control circuit voltage U_c		Auxiliary contacts fitted		Type	Order code		Pkg qty	Weight (1 pce)
Rated operational power 400 V AC-3 kW	current θ ≤ 55 °C AC-1 A	3-phase motor rating 480 V hp	General use rating 600 V AC A	50 Hz V AC	60 Hz V AC							kg
B6 mini contactors												
4	12	3	3.4	24	24	1	0	B6-30-10-P-01	GJL1211009R0101		10	0.170
						0	1	B6-30-01-P-01	GJL1211009R0011		10	0.170
				42	42	1	0	B6-30-10-P-02	GJL1211009R0102		10	0.170
						0	1	B6-30-01-P-02	GJL1211009R0012		10	0.170
				48	48	1	0	B6-30-10-P-03	GJL1211009R0103		10	0.170
						0	1	B6-30-01-P-03	GJL1211009R0013		10	0.170
				110 ... 127	110 ... 127	1	0	B6-30-10-P-84	GJL1211009R8104		10	0.170
						0	1	B6-30-01-P-84	GJL1211009R8014		10	0.170
				220 ... 240	220 ... 240	1	0	B6-30-10-P-80	GJL1211009R8100		10	0.170
						0	1	B6-30-01-P-80	GJL1211009R8010		10	0.170
				380 ... 415	380 ... 415	1	0	B6-30-10-P-85	GJL1211009R8105		10	0.170
						0	1	B6-30-01-P-85	GJL1211009R8015		10	0.170
B7 mini contactors												
5.5	12	5	7.6	24	24	1	0	B7-30-10-P-01	GJL1311009R0101		10	0.170
						0	1	B7-30-01-P-01	GJL1311009R0011		10	0.170
				42	42	1	0	B7-30-10-P-02	GJL1311009R0102		10	0.170
						0	1	B7-30-01-P-02	GJL1311009R0012		10	0.170
				48	48	1	0	B7-30-10-P-03	GJL1311009R0103		10	0.170
						0	1	B7-30-01-P-03	GJL1311009R0013		10	0.170
				110 ... 127	110 ... 127	1	0	B7-30-10-P-84	GJL1311009R8104		10	0.170
						0	1	B7-30-01-P-84	GJL1311009R8014		10	0.170
				220 ... 240	220 ... 240	1	0	B7-30-10-P-80	GJL1311009R8100		10	0.170
						0	1	B7-30-01-P-80	GJL1311009R8010		10	0.170
				380 ... 415	380 ... 415	1	0	B7-30-10-P-85	GJL1311009R8105		10	0.170
						0	1	B7-30-01-P-85	GJL1311009R8015		10	0.170

Other types on request

Main dimensions mm, *inches*



B6, B7

2CDC102023C0201

BC6, BC7 3-pole mini contactors – with soldering pins
4 to 5.5 kW
DC operated

BC7-30-10-P

Description

BC6, BC7 3-pole mini contactors are compact control products mainly used for switching resistive or motor loads up to 690 V AC.

These contactors are designed with:

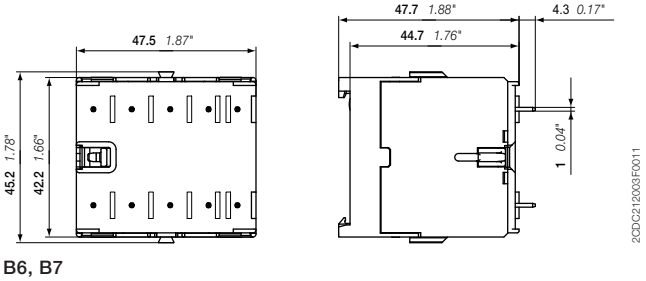
– 3 main poles and one built-in auxiliary contact
– control circuit: DC operated, low coil consumption (3.5 W at pull-in and at holding)
– hum-free coil
– add-on auxiliary contact blocks for side mounting
– designed for soldering on PCB boards

Ordering details

IEC		UL/CSA		Rated control circuit voltage U_c	Auxiliary contacts fitted	Type	Order code		Pkg qty	Weight (1 pce)
Rated operational power 400 V AC-3 kW	current θ ≤ 55 °C AC-1 A	3-phase motor rating 480 V hp	General use rating 600 V AC A	V DC						kg
BC6 mini contactors with 3 N.O. main poles										
4	12	3	3.4	12	1 0	BC6-30-10-P-07	GJL1213009R0107		10	0.170
					0 1	BC6-30-01-P-07	GJL1213009R0017		10	0.170
				24	1 0	BC6-30-10-P-01	GJL1213009R0101		10	0.170
					0 1	BC6-30-01-P-01	GJL1213009R0011		10	0.170
				48	1 0	BC6-30-10-P-16	GJL1213009R1106		10	0.170
					0 1	BC6-30-01-P-16	GJL1213009R1016		10	0.170
				60	1 0	BC6-30-10-P-03	GJL1213009R0103		10	0.170
					0 1	BC6-30-01-P-03	GJL1213009R0013		10	0.170
				110 ... 125	1 0	BC6-30-10-P-04	GJL1213009R0104		10	0.170
					0 1	BC6-30-01-P-04	GJL1213009R0014		10	0.170
				220 ... 240	1 0	BC6-30-10-P-05	GJL1213009R0105		10	0.170
					0 1	BC6-30-01-P-05	GJL1213009R0015		10	0.170
BC7 mini contactors with 3 N.O. main poles										
5.5	12	5	7.6	12	1 0	BC7-30-10-P-07	GJL1313009R0107		10	0.170
					0 1	BC7-30-01-P-07	GJL1313009R0017		10	0.170
				24	1 0	BC7-30-10-P-01	GJL1313009R0101		10	0.170
					0 1	BC7-30-01-P-01	GJL1313009R0011		10	0.170
				48	1 0	BC7-30-10-P-16	GJL1313009R1106		10	0.170
					0 1	BC7-30-01-P-16	GJL1313009R1016		10	0.170
				60	1 0	BC7-30-10-P-03	GJL1313009R0103		10	0.170
					0 1	BC7-30-01-P-03	GJL1313009R0013		10	0.170
				110 ... 125	1 0	BC7-30-10-P-04	GJL1313009R0104		10	0.170
					0 1	BC7-30-01-P-04	GJL1313009R0014		10	0.170
				220 ... 240	1 0	BC7-30-10-P-05	GJL1313009R0105		10	0.170
					0 1	BC7-30-01-P-05	GJL1313009R0015		10	0.170
BC6 mini contactors 2 N.O. + 1 N.C. main poles										
4	12	3	3.4	24	1 0	BC6-21-10-P-01	GJL1213109R0101		10	0.170
				48	1 0	BC6-21-10-P-16	GJL1213109R1106		10	0.170
				60	1 0	BC6-21-10-P-03	GJL1213109R0103		10	0.170
				110 ... 125	1 0	BC6-21-10-P-04	GJL1213109R0104		10	0.170
				220 ... 240	1 0	BC6-21-10-P-05	GJL1213109R0105		10	0.170

Other types on request

Main dimensions mm, *inches*



B6, B7

VB6, VB7 3-pole mini reversing contactors – with soldering pins
4 to 5.5 kW
AC operated

VB7-30-10-P

Description

VB6, VB7 3-pole compact design reversing contactors are space optimized control products mainly used for switching resistive or motor loads up to 690 V AC.

These reversing contactors are designed with:

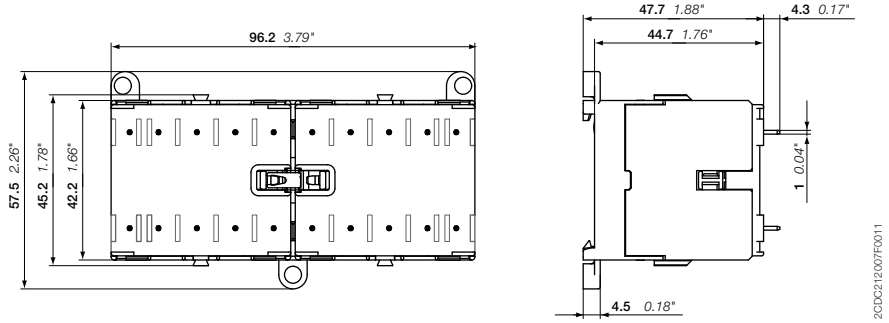
- built-in mechanical interlock. The coils must be mutually interlocked electrically and coils must be de-energised for 50 ms at least to prevent phase to phase short circuit on the arc
- control circuit: AC operated, low coil consumption (3.5 VA at pull-in and at holding)
- hum-free coil
- no auxiliary contact block permitted for mounting
- designed for soldering on PCB boards

Ordering details

IEC		UL/CSA		Rated control circuit voltage U_c		Auxiliary contacts fitted		Type	Order code		Pkg qty	Weight (1 pce)
Rated operational power 400 V AC-3	current θ ≤ 55 °C AC-1	3-phase motor rating 480 V	General use rating 600 V AC	50 Hz	60 Hz							
kW	A	hp	A	V AC	V AC							kg
VB6 mini reversing contactors												
4	12	3	3.4	24	24	1	0	VB6-30-10-P-01	GJL1211909R0101		5	0.345
						0	1	VB6-30-01-P-01	GJL1211909R0011		5	0.345
				42	42	1	0	VB6-30-10-P-02	GJL1211909R0102		5	0.345
						0	1	VB6-30-01-P-02	GJL1211909R0012		5	0.345
				48	48	1	0	VB6-30-10-P-03	GJL1211909R0103		5	0.345
						0	1	VB6-30-01-P-03	GJL1211909R0013		5	0.345
				110 ... 127	110 ... 127	1	0	VB6-30-10-P-84	GJL1211909R8104		5	0.345
						0	1	VB6-30-01-P-84	GJL1211909R8014		5	0.345
				220 ... 240	220 ... 240	1	0	VB6-30-10-P-80	GJL1211909R8100		5	0.345
						0	1	VB6-30-01-P-80	GJL1211909R8010		5	0.345
				380 ... 415	380 ... 415	1	0	VB6-30-10-P-85	GJL1211909R8105		5	0.345
						0	1	VB6-30-01-P-85	GJL1211909R8015		5	0.345
VB7 mini reversing contactors												
5.5	12	5	7.6	24	24	1	0	VB7-30-10-P-01	GJL1311909R0101		5	0.345
						0	1	VB7-30-01-P-01	GJL1311909R0011		5	0.345
				42	42	1	0	VB7-30-10-P-02	GJL1311909R0102		5	0.345
						0	1	VB7-30-01-P-02	GJL1311909R0012		5	0.345
				48	48	1	0	VB7-30-10-P-03	GJL1311909R0103		5	0.345
						0	1	VB7-30-01-P-03	GJL1311909R0013		5	0.345
				110 ... 127	110 ... 127	1	0	VB7-30-10-P-84	GJL1311909R8104		5	0.345
						0	1	VB7-30-01-P-84	GJL1311909R8014		5	0.345
				220 ... 240	220 ... 240	1	0	VB7-30-10-P-80	GJL1311909R8100		5	0.345
						0	1	VB7-30-01-P-80	GJL1311909R8010		5	0.345
				380 ... 415	380 ... 415	1	0	VB7-30-10-P-85	GJL1311909R8105		5	0.345
						0	1	VB7-30-01-P-85	GJL1311909R8015		5	0.345

Other types on request

Main dimensions mm, *inches*



VB6, VB7

2CDC102025C0201

VBC6, VBC7 3-pole mini reversing contactors – with soldering pins
4 to 5.5 kW
DC operated

VBC7-30-10-P

Description

VBC6, VBC7 3-pole compact design reversing contactors are space optimized control products mainly used for switching resistive or motor loads up to 690 V AC.

These reversing contactors are designed with:

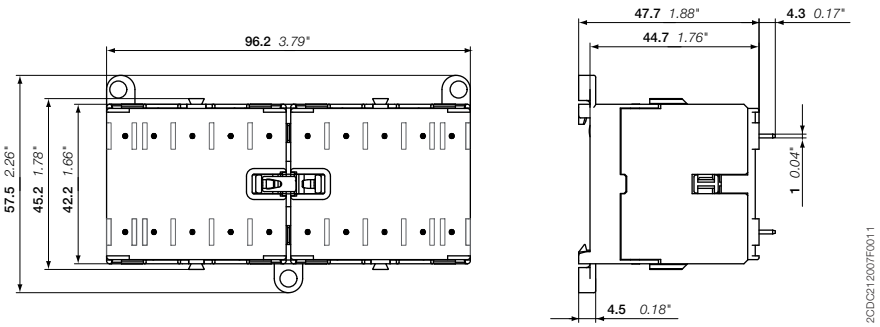
- built-in mechanical interlock. The coils must be mutually interlocked electrically and coils must be de-energised for 50 ms at least to prevent phase to phase short circuit on the arc
- control circuit: DC operated, low coil consumption (3.5 W at pull-in and at holding)
- hum-free coil
- no auxiliary contact block permitted for mounting
- designed for soldering on PCB boards

Ordering details

IEC		UL/CSA		Rated control circuit voltage U_c	Auxiliary contacts fitted		Type	Order code		Pkg qty	Weight (1 pce)
Rated operational power 400 V AC-3	current θ ≤ 55 °C AC-1	3-phase motor rating 480 V	General use rating 600 V AC								
kW	A	hp	A	V DC							kg
VBC6 mini reversing contactors											
4	12	3	3.4	12	1	0	VBC6-30-10-P-07	GJL1213909R0107		5	0.345
					0	1	VBC6-30-01-P-07	GJL1213909R0017		5	0.345
				24	1	0	VBC6-30-10-P-01	GJL1213909R0101		5	0.345
					0	1	VBC6-30-01-P-01	GJL1213909R0011		5	0.345
				48	1	0	VBC6-30-10-P-06	GJL1213909R0106		5	0.345
					0	1	VBC6-30-06-P-06	GJL1213909R0016		5	0.345
				60	1	0	VBC6-30-10-P-03	GJL1213909R0103		5	0.345
					0	1	VBC6-30-01-P-03	GJL1213909R0013		5	0.345
				110 ... 125	1	0	VBC6-30-10-P-04	GJL1213909R0104		5	0.345
					0	1	VBC6-30-01-P-04	GJL1213909R0014		5	0.345
				220 ... 240	1	0	VBC6-30-10-P-05	GJL1213909R0105		5	0.345
					0	1	VBC6-30-01-P-05	GJL1213909R0015		5	0.345
VBC7 mini reversing contactors											
5.5	12	5	7.6	12	1	0	VBC7-30-10-P-07	GJL1313909R0107		5	0.345
					0	1	VBC7-30-01-P-07	GJL1313909R0017		5	0.345
				24	1	0	VBC7-30-10-P-01	GJL1313909R0101		5	0.345
					0	1	VBC7-30-01-P-01	GJL1313909R0011		5	0.345
				48	1	0	VBC7-30-10-P-16	GJL1313909R1106		5	0.345
					0	1	VBC7-30-01-P-16	GJL1313909R1016		5	0.345
				60	1	0	VBC7-30-10-P-03	GJL1313909R0103		5	0.345
					0	1	VBC7-30-01-P-03	GJL1313909R0013		5	0.345
				110 ... 125	1	0	VBC7-30-10-P-04	GJL1313909R0104		5	0.345
					0	1	VBC7-30-01-P-04	GJL1313909R0014		5	0.345
				220 ... 240	1	0	VBC7-30-10-P-05	GJL1313909R0105		5	0.345
					0	1	VBC7-30-01-P-05	GJL1313909R0015		5	0.345

Other types on request

Main dimensions mm, *inches*



VBC6, VBC7

K6 4-pole mini contactor relays – with soldering pins
AC operated

K6-22Z-P

3

Description

K6 4-pole mini contactor relays are space optimized control products mainly used for control functions or for small loads up to 4 A.

These contactors are designed with:

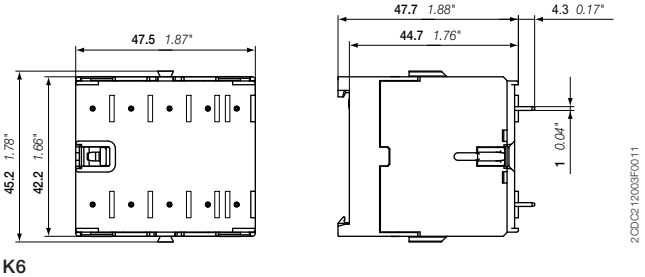
– 4 poles with various contact combinations
– control circuit: AC operated, low coil consumption (3.5 VA at pull-in and at holding)
– hum-free coil
– add-on auxiliary contact block for side mounting
– designed for soldering on PCB boards

Ordering details

Rated control circuit voltage U_c		Auxiliary contacts fitted		Type	Order code		Pkg qty	Weight (1 pce)
50 Hz V AC	60 Hz V AC							kg
K6 4-pole mini contactor relays								
24	24	2	2	K6-22Z-P-01	GJH1211009R0221		10	0.170
42	42	2	2	K6-22Z-P-02	GJH1211009R0222		10	0.170
48	48	2	2	K6-22Z-P-03	GJH1211009R0223		10	0.170
110 ...127	110 ...127	2	2	K6-22Z-P-84	GJH1211009R8224		10	0.170
220 ... 240	220 ... 240	2	2	K6-22Z-P-80	GJH1211009R8220		10	0.170
380 ... 415	380 ... 415	2	2	K6-22Z-P-85	GJH1211009R8225		10	0.170
24	24	3	1	K6-31Z-P-01	GJH1211009R0311		10	0.170
42	42	3	1	K6-31Z-P-02	GJH1211009R0312		10	0.170
48	48	3	1	K6-31Z-P-03	GJH1211009R0313		10	0.170
110 ...127	110 ...127	3	1	K6-31Z-P-84	GJH1211009R8314		10	0.170
220 ... 240	220 ... 240	3	1	K6-31Z-P-80	GJH1211009R8310		10	0.170
380 ... 415	380 ... 415	3	1	K6-31Z-P-85	GJH1211009R8315		10	0.170
24	24	4	0	K6-40E-P-01	GJH1211009R0401		10	0.170
42	42	4	0	K6-40E-P-02	GJH1211009R0402		10	0.170
48	48	4	0	K6-40E-P-03	GJH1211009R0403		10	0.170
110 ...127	110 ...127	4	0	K6-40E-P-84	GJH1211009R8404		10	0.170
220 ... 240	220 ... 240	4	0	K6-40E-P-80	GJH1211009R8400		10	0.170
380 ... 415	380 ... 415	4	0	K6-40E-P-85	GJH1211009R8405		10	0.170

Other types on request

Main dimensions mm, *inches*



K6

2CDC102030C0201

KC6 4-pole mini contactor relays – with soldering pins
DC operated

KC6-22Z-P

KC6-31Z-P

Description

KC6 4-pole mini contactor relays are space optimized control products mainly used for control functions or for small loads up to 4 A.

These contactors are designed with:

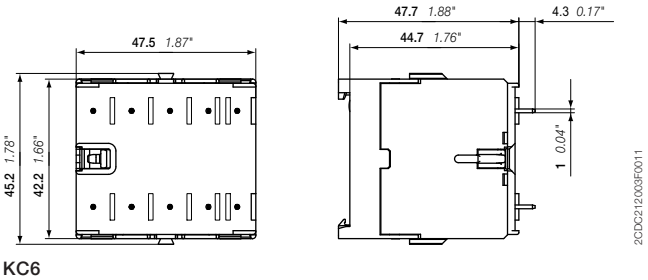
– 4 poles with various contact combinations
– control circuit: DC operated, low coil consumption (3.5 W at pull-in and at holding)
– hum-free coil
– add-on auxiliary contact block for side mounting
– designed for soldering on PCB boards

Ordering details

Rated control circuit voltage U_c V DC	Auxiliary contacts fitted	Type	Order code		Pkg qty	Weight (1 pce) kg
K6 4-pole mini contactor relays						
12	2 2	KC6-22Z-P-07	GJH1213009R0227		10	0.170
24	2 2	KC6-22Z-P-01	GJH1213009R0221		10	0.170
48	2 2	KC6-22Z-P-16	GJH1213009R1226		10	0.170
110 ... 125	2 2	KC6-22Z-P-04	GJH1213009R0224		10	0.170
220 ... 240	2 2	KC6-22Z-P-05	GJH1213009R0225		10	0.170
24	3 1	KC6-31Z-P-01	GJH1213009R0311		10	0.170
48	3 1	KC6-31Z-P-16	GJH1213009R1316		10	0.170
110 ... 125	3 1	KC6-31Z-P-04	GJH1213009R0314		10	0.170
220 ... 240	3 1	KC6-31Z-P-05	GJH1213009R0315		10	0.170
12	4 0	KC6-40E-P-07	GJH1213009R0407		10	0.170
24	4 0	KC6-40E-P-01	GJH1213009R0401		10	0.170
48	4 0	KC6-40E-P-16	GJH1213009R1406		10	0.170
110 ... 125	4 0	KC6-40E-P-04	GJH1213009R0404		10	0.170
220 ... 240	4 0	KC6-40E-P-05	GJH1213009R0405		10	0.170

Other types on request

Main dimensions mm, *inches*



KC6

BC6, BC7 3-pole interface mini contactors – with soldering pins
4 to 5.5 kW
DC operated

BC7-30-10-P

3

Description

BC6, BC7 3-pole interface mini contactors are compact control products mainly used for switching resistive or motor loads up to 690 V AC.

These contactors are designed with:

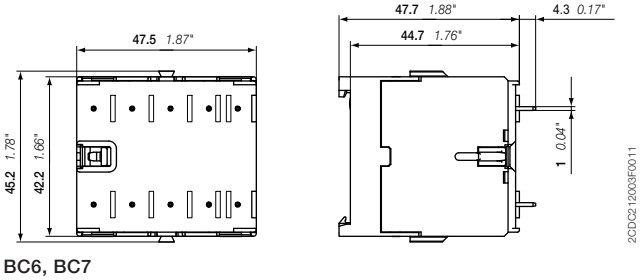
– 3 main poles and one built-in auxiliary contact
– control circuit: DC operated, low coil consumption (1.4 ... 2.4 W at pull-in and at holding)
– hum-free coil
– no auxiliary contact block permitted for mounting
– designed for soldering on PCB boards

Ordering details

IEC		UL/CSA		Rated control circuit voltage U_c	Auxiliary contacts fitted	Type	Order code		Pkg qty	Weight (1 pce)
Rated operational power 400 V AC-3 kW	current θ ≤ 55 °C AC-1 A	3-phase motor rating 480 V hp	General use rating 600 V AC A	V DC						kg
DC operation 24 V / 1.4 W										
4	12	3	3.4	24	1 0	BC6-30-10-P-1.4-81	GJL1213009R8101		10	0.170
					0 1	BC6-30-01-P-1.4-81	GJL1213009R8011		10	0.170
5.5	12	5	7.6	24	1 0	BC7-30-10-P-1.4-81	GJL1313009R8101		10	0.170
					0 1	BC7-30-01-P-1.4-81	GJL1313009R8011		10	0.170
DC operation 17 ... 32 V / 2.4 W, I_{th} < 8 A										
4	12	3	3.4	17 ... 32	1 0	BC6-30-10-P-2.4-51	GJL1213009R5101		10	0.170
					0 1	BC6-30-01-P-2.4-51	GJL1213009R5011		10	0.170
5.5	12	5	7.6	17 ... 32	1 0	BC7-30-10-P-2.4-51	GJL1313009R5101		10	0.170
					0 1	BC7-30-01-P-2.4-51	GJL1313009R5011		10	0.170

Other types on request

Main dimensions mm, *inches*



BC6, BC7

2CDC102029C0201

KC6 4-pole interface mini contactor relays – with solderings pins
DC operated

KC6-31Z-P-1.4

Description

KC6 4-pole interface mini contactor relays are space optimized control products mainly used for control functions or for small loads up to 4 A.

These contactors are designed with:

- 4 poles with various contact combinations
- control circuit: DC operated, low coil consumption (3.5 W at pull-in and at holding)
- hum-free coil
- add-on auxiliary contact block for side mounting
- designed for soldering on PCB boards

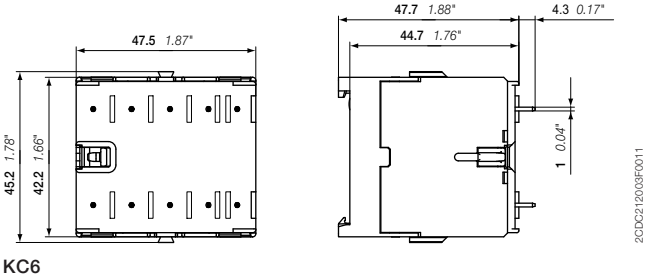
3

Ordering details

Rated control circuit voltage U_c	Auxiliary contacts fitted	Type	Order code		Pkg qty	Weight (1 pce)
V DC						kg
DC operation 24 V / 1.4 W						
24	3 1	KC6-31Z-P-1.4-81	GJH1213009R8311		10	0.170
24	4 0	KC6-40E-P-1.4-81	GJH1213009R8401		10	0.170
DC operation 17 ... 32 V / 2.4 W						
17 ... 32	3 1	KC6-31Z-P-2.4-51	GJH1213009R5311		10	0.170
17 ... 32	4 0	KC6-40E-P-2.4-51	GJH1213009R5401		10	0.170

Other types on request

Main dimensions mm, *inches*



KC6

B6, B7, BC6, BC7 3- and 4-pole mini contactors
VB6, VB7, VBC6, VBC7 3-pole mini reversing contactors
Accessories

2CDC211012S0010

CAF6-11N

2CDC211007S0010

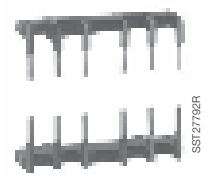
RV-BC6/250

2CDC211008S0010

CA6-11E

2CDC211018S0011

CA6-11E-P


SST27792R

BSM6-30

2CDC231012F0011

T16

Ordering details

For contactors	Auxiliary contacts	Type	Order code	Pkg qty	Weight (1 pce) kg
Front-mounted instantaneous auxiliary contact blocks (not allowed for mounting on TBC, B6S, B7S, interface contactors) [1]					
B6-, B7-40-00, BC6-, BC7-40-00 VB6, VB7, VBC6, VBC7, VB6A, VB7A VBC6A, VBC7A	1 1	CAF6-11E	GJL1201330R0002	10	0.020
	2 0	CAF6-20E	GJL1201330R0006	10	0.020
	0 2	CAF6-02E	GJL1201330R0010	10	0.020
B6-, B7-30-10, BC6-, BC7-30-10 VB6, VB7, VBC6, VBC7, VB6A, VB7A VBC6A, VBC7A	1 1	CAF6-11M	GJL1201330R0003	10	0.020
	2 0	CAF6-20M	GJL1201330R0007	10	0.020
	0 2	CAF6-02M	GJL1201330R0011	10	0.020
B6-, B7-30-01, BC6-, BC7-30-01 VB6, VB7, VBC6, VBC7, VB6A, VB7A VBC6A, VBC7A	1 1	CAF6-11N	GJL1201330R0004	10	0.020
	2 0	CAF6-20N	GJL1201330R0008	10	0.020
	0 2	CAF6-02N	GJL1201330R0012	10	0.020
Side-mounted instantaneous auxiliary contact block [1]					
B6-, B7-40-00, BC6-, BC7-40-00	1 1	CA6-11E	GJL1201317R0002	10	0.030
B6-, B7-30-10, BC6-, BC7-30-10	1 1	CA6-11M	GJL1201317R0003	10	0.030
B6-, B7-30-01, BC6-, BC7-30-01	1 1	CA6-11N	GJL1201317R0004	10	0.030
Side-mounted instantaneous auxiliary contact block with soldering pins [1]					
B6-, B7-40-00-P, BC6-,BC7-40-00-P	1 1	CA6-11E-P	GJL1201319R0002	10	0.025
B6-, B7-30-10-P, BC6-, BC7-30-10-P	1 1	CA6-11M-P	GJL1201319R0003	10	0.025
B6-, B7-30-01-P, BC6-, BC7-30-01-P	1 1	CA6-11N-P	GJL1201319R0004	10	0.025
Soldering receptacle (I_e < 8 A)					
B6, B7, BC6, BC7		LB6	GJL1201902R0001	10	0.020
2-pole aux.contact blocks CA		LB6-CA	GJL1201903R0001	10	0.010

[1] CA6 and CAF6 must not be fitted simultaneously.

For contactors	Rated control circuit voltage U_C V DC	Connection type	Type	Order code	Pkg qty	Weight (1 pce) kg
Surge suppressors for contactor coils						
BC6, BC7	24 ... 60	Cable lug	RV-BC6/60	GHV2501902R0002	10	0.005
		Flat pin, 2.8 mm	RV-BC6-F/60	GHV2501902R0003	10	0.005
	50 ... 250	Cable lug	RV-BC6/250	GHV2501903R0002	10	0.005
		Flat pin, 2.8 mm	RV-BC6-F/250	GHV2501903R0003	10	0.010
	380	Cable lug	RV-BC6/380	GHV2501904R0002	10	0.005
		Flat pin, 2.8 mm	RV-BC6-F/380	GHV2501904R0003	10	0.010

Note: Mini contactors for AC operation have an integrated protective circuit

Connecting links with manual motor starters					
To connect B..VB.. mini contactor to MS116, MS132	BEA7/132	1SBN080906R1002	10	0.013
To connect B..VB.. mini contactors to MS325	BEA7/325	1SBN080906R1001	10	0.021
Connection sets for reversing contactors					
VB6, VB7, VBC6, VBC7, VB6A, VB7A, VBC6A, VBC7A, cross-section 1.8 mm²	BSM6-30	GJL1201908R0001	10	0.010
Parallel connecting link					
B6, B7, BC6, BC7	LP6	GJL1201907R0001	100	0.009
Cover cap, transparent fitting to DIN rail design, sealable					
B6, B7, BC6, BC7	LT6-B	GJL1201906R0001	10	0.015

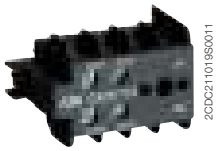
Overload relays fitting details [2]

Contactor types	Thermal overload relays	Electronic overload relays
B6, B7, BC6, BC7	T16 (0.10...16 A)	E16DU (0.10...18.9 A)

[2] Direct mounting - No kit required. Ordering details, see overload relays section.

1SBC101635S0201

K6, KC6 4-pole mini contactor relays
Accessories


2CDC211019S0011

CAF6-11K

2CDC211009S0010

CA6-11K

2CDC211011S0010

CA6-11K-P

2CDC211006S0010

LT6-B

2CDC211007S0010

RV-BC6/250

Ordering details

For contactors	Auxiliary contacts	Type	Order code		Pkg qty	Weight (1 pce) kg
Front-mounted instantaneous auxiliary contact blocks [1]						
K6, KC6	1 1	CAF6-11K	GJL1201330R0001		10	0.020
	2 0	CAF6-20K	GJL1201330R0005		10	0.020
	0 2	CAF6-02K	GJL1201330R0009		10	0.020
Side-mounted instantaneous auxiliary contact block [1]						
K6, KC6	1 1	CA6-11K	GJL1201317R0001		10	0.030
Side-mounted instantaneous auxiliary contact block with soldering pins [1]						
K6..P, KC6..P	1 1	CA6-11K-P	GJL1201319R0001		10	0.025
Soldering receptacle (I_e < 8 A)						
K6, KC6		LB6	GJL1201902R0001		10	0.020
2-pole auxiliary contact blocks CA		LB6-CA	GJL1201903R0001		10	0.010

[1] CA6 and CAF6 must not be fitted simultaneously.

For contactors	Rated control circuit voltage U_C V DC	Connection type	Type	Order code		Pkg qty	Weight (1 pce) kg
Surge suppressors for contactor coils							
KC6	24 ... 60	Cable lug	RV-BC6/60	GHV2501902R0002		10	0.005
		Flat pin, 2.8 mm	RV-BC6-F/60	GHV2501902R0003		10	0.005
	50 ... 250	Cable lug	RV-BC6/250	GHV2501903R0002		10	0.005
		Flat pin, 2.8 mm	RV-BC6-F/250	GHV2501903R0003		10	0.010
	380	Cable lug	RV-BC6/380	GHV2501904R0002		10	0.005
		Flat pin, 2.8 mm	RV-BC6-F/380	GHV2501904R0003		10	0.010

Note: Mini contactors for AC operation have an integrated protective circuit

Cover cap, transparent fitting to DIN rail design, sealable						
K6, KC6	LT6-B	GJL1201906R0001		10	0.015	

B6, B7, BC6, BC7, TBC7 3- and 4-pole mini contactors
VB6, VB7, VBC6, VBC7 3- and 4-pole mini reversing contactors
Technical data

Main pole – Utilization characteristics according to IEC

Contactor types	**AC operated**	**B6, VB6, VB6A**	**B7, VB7, VB7A**
	DC operated	**BC6, VBC6, VBC6A**	**BC7, TBC7, VBC7, VBC7A**
Standards		IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1	
Rated operational voltage $U_{e\,max}$		690 V AC	
Rated frequency (without derating)		DC or 50 / 60 Hz	
Conventional free-air thermal current I_{th} acc. to IEC 60947-4-1, open contactors, θ ≤ 40 °C, with conductor cross-sectional area		20 A	
AC-1 Utilization category for air temperature close to contactor θ ≤ 40 °C			
I_e / Rated operational current AC-1 $U_{e\,max}$ ≤ 690 V, 50/60 Hz	**220-230-240 V**	Screw terminal types: 20 A Soldering pin types: 12 A Flat pin types: 16 A	
	380-400 V	Screw terminal types: 20 A Soldering pin types: 12 A Flat pin types: 16 A	
	440 V	Screw terminal types: 20 A Soldering pin types: 12 A Flat pin types: 16 A	
	500 V	12 A	
	690 V	6 A	
AC-1 Utilization category for air temperature close to contactor θ ≤ 55 °C			
I_e / Rated operational current AC-1 $U_{e\,max}$ ≤ 690 V, 50/60 Hz	**220-230-240 V**	Screw terminal types: 16 A Soldering pin types: 12 A Flat pin types: 16 A	Screw terminal types: 20 A Soldering pin types: 12 A Flat pin types: 16 A
	380-400 V	Screw terminal types: 16 A Soldering pin types: 12 A Flat pin types: 16 A	Screw terminal types: 20 A Soldering pin types: 12 A Flat pin types: 16 A
	440 V	Screw terminal types: 16 A Soldering pin types: 12 A Flat pin types: 16 A	Screw terminal types: 20 A Soldering pin types: 12 A Flat pin types: 16 A
	500 V	12 A	
	690 V	6 A	
AC-3 Utilization category for air temperature close to contactor θ ≤ 55 °C			
I_e / Rated operational current AC-3 3-phase motors 	**220-230-240 V**	9 A	12 A
	380-400 V	8 A	12 A
	440 V	8 A	12 A
	500 V	6.5 A	9 A
	690 V	3.5 A	3.5 A
Rated operational power AC-3 1500 r.p.m. 50 Hz 1800 r.p.m. 60 Hz 3-phase motors 	**220-230-240 V**	2.2 kW	3 kW
	380-400 V	4 kW	5.5 kW
	440 V	4 kW	5.5 kW
	500 V	3 kW	4 kW
	690 V	3 kW	3 kW
DC-1 Utilization category for air temperature close to contactor θ ≤ 55 °C			
I_e / Rated operational current DC-1	**110 V**	-	4 A
	220 V	-	0.6 A
DC-3 Utilization category for air temperature close to contactor θ ≤ 55 °C			
I_e / Rated operational current DC-3	**110 V**	-	1.5 A
	220 V	-	0.25 A
DC-5 Utilization category for air temperature close to contactor θ ≤ 55 °C			
I_e / Rated operational current DC-5	**110 V**	-	0.4 A
	220 V	-	0.2 A
Rated making capacity AC-3		10 x I_e AC-3 acc. to IEC 60947-4-1	
Rated breaking capacity AC-3		8 x I_e AC-3 acc. to IEC 60947-4-1	
Short-circuit protection device for contactors without thermal O/L relay - motor protection excluded U_e ≤ 500 V AC - gG type fuse		Coordination type 1: 25 A / Coordination type 2: 20 A	
Rated short-time withstand current I_{cw} at 40 °C ambient temperature, in free air from a cold state	**10 s**	64 A	96 A
Maximum breaking capacity cos ϕ = 0.45	**at 400 V**	64 A	96 A
Maximum electrical switching frequency	**AC-1**	300 cycles/h	
	AC-3	600 cycles/h	
	DC-1, DC-3, DC-5	600 cycles/h	

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B6, B7, BC6, BC7, TBC7 3- and 4-pole mini contactors
VB6, VB7, VBC6, VBC7 3- and 4-pole mini reversing contactors
Technical data

Main pole – Utilization characteristics according to UL/NEMA/CSA

Contactor types		**AC operated**	B6, VB6, VB6A	B7, VB7, VB7A
		DC operated	BC6, VBC6, VBC6A	BC7, TBC7, VBC7, VBC7A
Standards			UL 508, CSA C22.2 N°14	
Maximum operational voltage			600 V	
UL/CSA general use rating			12 A	16 A
UL/CSA maximum 1-phase motor rating				
	Full load current	**120 V AC**	8.4 A	13.8 A
		240 V AC	6.8 A	10.0 A
	Horse power rating	**120 V AC**	1 hp	0.75 hp
		240 V AC	2 hp	1.5 hp
UL/CSA maximum 3-phase motor rating				
	Full load current [1]	**200-208 V AC**	4.6 A	7.5 A
		220-240 V AC	6.8 A	9.6 A
		440-480 V AC	3.4 A	7.6 A
		550-600 V AC	1.7 A	6.1 A
	Horse power rating [1]	**200-208 V AC**	1 hp	2 hp
		220-240 V AC	2 hp	3 hp
		440-480 V AC	3 hp	5 hp
		550-600 V AC	1 hp	5 hp
Short-circuit protection device for contactors				
without thermal overload relay - motor protection excluded				
	Fuse rating	**600 V**	40 A	
	Fuse type	**600 V**	Class J	
Maximum electrical switching frequency				
	For resitive loads AC-1		300 cycles/h	
	For motor loads AC-3		600 cycles/h	

[1] For the corresponding kW/A or hp/A values of 1500 r.p.m, 50 Hz or 1800 r.p.m, 60 Hz, 3-phase motors, see "Motor rated operational powers and currents".

General technical data

Contactor types		**AC operated**	B6, VB6, VB6A	B7, VB7, VB7A
		DC operated	BC6, VBC6, VBC6A	BC7, TBC7, VBC7, VBC7A
Rated insulation voltage U_i				
	acc. to IEC 60947-4-1		690 V	
	acc. to UL/CSA		600 V	
Rated impulse withstand voltage U_{imp}			6 kV	
Ambient air temperature, close to contactor				
	Operation	Fitted with thermal overload relay	-25 ... +55 °C	
		Without thermal overload relay	-25 ... +55 °C	
	Storage		-40 ... +80 °C	
Climatic withstand			acc. to IEC 60947-1 Annex Q	
Maximum operating altitude (without derating)			2000 m	
Mechanical durability			10^7 operating cycles	
Resistance to shock			Half-sine	
	acc. to IEC 60068-2-27 and EN 60068-2-27		15 g / 11 ms	
	acc. to IEC/EN 60947-1 Annex. Q		Category E	
Resistance to vibrations			Sinusoidal	
	acc. to IEC 60068-2-27 and EN 60068-2-27		5 g / 3 ... 150 Hz	
	acc. to IEC/EN 60947-1 Annex. Q		Category E	

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B6, B7, BC6, BC7, TBC7 3- and 4-pole mini contactors
VB6, VB7, VBC6, VBC7 3- and 4-pole mini reversing contactors
Technical data

Magnet system characteristics for B6, B7 contactors

Contactor types	**AC operated**	B6, VB6	B7, VB7
Coil operating limits acc. to IEC 60947-4-1	**AC supply**	0.85 ... 1.1 x U_c	
AC control voltage			
Rated control circuit voltage U_C		See ordering tables	
Coil consumption	Average pull-in value	3.5 VA / 3.5 W	
	Average holding value	3.5 VA / 3.5 W	
Drop-out voltage		0.20 ... 0.75 % of U_c	

Magnet system characteristics for BC6, BC7 contactors

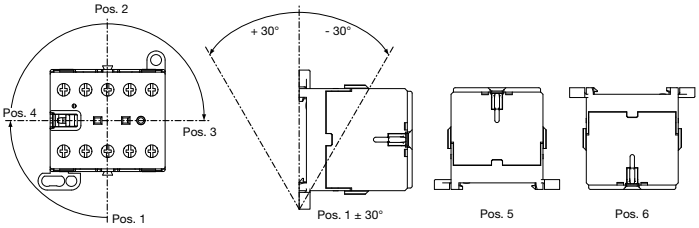
Contactor types	**DC operated**	BC6, VBC6	BC7, VBC7
Coil operating limits acc. to IEC 60947-4-1	**DC supply**	0.85 ... 1.1 x U_c	
AC control voltage			
Rated control circuit voltage U_C		See ordering tables	
Coil consumption [1]	Average pull-in value	3.5 VA / 3.5 W	
	Average holding value	3.5 VA / 3.5 W	
Drop-out voltage in % of $U_{C\,min}$		0.10 ... 0.75 x U_C	

[1] Interface mini-contactors: see coil consumption on ordering details pages

Magnet system characteristics for TBC7 contactors

Contactor types	**DC operated**	TBC7
Coil operating limits acc. to IEC 60947-4-1	**DC supply**	Wide range voltage supply see ordering tables, U_{Cmin} ... U_{Cmax}
AC control voltage		
Rated control circuit voltage U_C		See ordering tables
Coil consumption	Average pull-in value	5 VA / 5 W
	Average holding value	5 VA / 5 W
Drop-out voltage in % of $U_{C\,min}$		≤ 0.20 % of U_{Cmin}

Mounting characteristics and conditions for use

Contactor types	**AC operated**	B6, VB6, VB6A	B7, VB7, VB7A
	DC operated	BC6, VBC6, VBC6A	BC7, TBC7, VBC7, VBC7A
Mounting positions			
Mounting distances		The contactors can be assembled side by side	
Fixing			
On rail acc. to IEC 60715, EN 60715		35 x 7.5 mm or 35 x 15 mm	
By screws (not supplied)		2 x M4 screws placed diagonally	

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B6, B7, BC6, BC7, TBC7 3- and 4-pole mini contactors
VB6, VB7, VBC6, VBC7 3- and 4-pole mini reversing contactors
Technical data

Built-in auxiliary contacts according to IEC

Contactor types	AC operated	B6, VB6, VB6A	B7, VB7, VB7A
	DC operated	BC6, VBC6, VBC6A	BC7, TBC7, VBC7, VBC7A
Standards		IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1	
Rated operational voltage Ue max		690 V	
Rated frequency (without derating)		DC or 50 / 60 Hz	
Conventional free-air thermal current I_{th} θ ≤ 40 °C		6 A	
I_e / Rated operational current AC-15 acc. to IEC 60947-5-1	24 V 50/60 Hz	4 A	
	110-120 V 50/60 Hz	4 A	
	220-230-240 V 50/60 Hz	4 A	
	380-400 V 50/60 Hz	3 A	
	440 V 50/60 Hz	3 A	
I_e / Rated operational current DC-13 acc. to IEC 60947-5-1	24 V DC	2.5 A	
	110 V DC	0.7 A	
	220 - 240 V DC	0.4 A	
Short-circuit protection device		6 A, Type gG	
Minimum switching capacity with failure rate acc. to IEC 60947-5-4		17 V / 5 mA	
Maximum electrical switching frequency	AC-15	600 cycles/h	
	DC-13	600 cycles/h	

Built-in auxiliary contacts according to UL/CSA

Contactor types	AC operated	B6, VB6, VB6A	B7, VB7, VB7A
	DC operated	BC6, VBC6, VBC6A	BC7, VBC7, VBC7A
Max. operational voltage		600 V AC	
Pilot duty		A600	
AC thermal rated current		5 A	

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B6, B7, BC6, BC7, TBC7 3- and 4-pole mini contactors
VB6, VB7, VBC6, VBC7 3- and 4-pole mini reversing contactors
Technical data

Connection characteristics

Contactor types	**AC operated**	B6, VB6, VB6A	B7, VB7, VB7A
	DC operated	BC6, VBC6, VBC6A	BC7, TBC7, VBC7, VBC7A
Main terminals [1]		Screw terminals with cable clamp	
Connection capacity			
Main conductors (poles)			
Rigid: solid	**1 or 2 x**	1 ... 4 mm²	
Flexible without ferrule	**1 or 2 x**	1 ... 2.5 mm²	
Connection capacity acc. to UL/CSA	**1 or 2 x**	AWG 22 ... 10	
Stripping length		9 mm	
Tightening torques		0.8 ... 1.1 Nm / 7 lb.in	
Connection capacity – auxiliary conductors (built-in auxiliary terminals + coil terminals)			
Rigid: solid	**1 or 2 x**	1 ... 4 mm²	
Flexible without ferrule	**1 or 2 x**	1 ... 2.5 mm²	
Connection capacity acc. to UL/CSA	**1 or 2 x**	AWG 22 ... 10	
Stripping length		9 mm	
Tightening torques			
Coil terminals		0.8 ... 1.1 Nm / 7 lb.in	
Built-in auxiliary terminals		0.8 ... 1.1 Nm / 7 lb.in	
Degree of protection acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529			
Main terminals		IP20	
Coil terminals		IP20	
Built-in auxiliary terminals		IP20	
Screw terminals		(Delivered in open position, screws of unused terminals must be tightened)	
All terminals		M3	
Screwdriver type		Flat Ø 5.5 mm / Pozidriv 1	

[1] Soldering pin connection acc. to DIN 40801: 0.8 x 1 mm / 0.8 x 2.54 mm
Flat pin connection acc. to DIN 46248: 1 x 6.3 mm / 1 x 2.8 mm

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K6, KC6, TKC6 4-pole mini contactor relays
Technical data

Main pole – Utilization characteristics according to IEC

Contactor types	AC operated	K6
	DC operated	KC6, TKC6
Standards		IEC 60947-1 / 60947-5-1 and EN 60947-1 / 60947-5-1
Rated operational voltage U_{emax}		690 V
Rated frequency (without derating)		DC or 50 / 60 Hz
Conventional free-air thermal current I_{th} θ ≤ 40 °C		6 A
I_e / Rated operational current AC-15 acc. to IEC 60947-5-1	24 V 50/60 Hz	4 A
	110-120 V 50/60 Hz	4 A
	220-230-240 V 50/60 Hz	4 A
	380-400 V 50/60 Hz	3 A
	440 V 50/60 Hz	3 A
	480-500 V 50/60 Hz	2 A
I_e / Rated operational current DC-13 acc. to IEC 60947-5-1	24 V DC	2.5 A
	110 V DC	0.7 A
	220 - 240 V DC	0.4 A
Short-circuit protection device for contactors U_e ≤ 500 V AC, gG fuse type		6 A
Minimum switching capacity		17 V / 5 mA
Maximum electrical switching frequency	AC-15	600 cycles/h
	DC-13	600 cycles/h

Main pole – Utilization characteristics according to UL/NEMA/CSA

Contactor types	AC operated	K6
	DC operated	KC6
Standards		UL 508, CSA C22.2 No14
Maximum operational voltage		600 V AC
Pilot duty		A600

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K6, KC6, TKC6 4-pole mini contactor relays
Technical data

General technical data

Contactor relay types	**AC operated**	**K6**
	DC operated	**KC6, TKC6**
Rated insulation voltage U_i		
acc. to IEC 60947-5-1		690 V
acc. to UL/CSA		600 V
Rated impulse withstand voltage U_{imp}		6 kV
Electromagnetic compatibility		
Ambient air temperature close to contactor relay	Operation in free air	-25 ... +55 °C
	Storage	-40 ... +80 °C
Climatic withstand		acc. to IEC 60068-2-30
Maximum operating altitude (without derating)		2000 m
Mechanical durability		10^7 operating cycles
Resistance to shock		Half-sine
acc. IEC 60068-2-27 and EN 60068-2-27		15 g / 11ms
acc. to IEC/EN 60947-1 Annex. Q		Category E
Resistance to vibrations		Sinusoidal
acc. IEC 60068-2-27 and EN 60068-2-27		5 g / 3 ... 150 Hz
acc. to IEC/EN 60947-1 Annex. Q		Kategorie E

Magnet system characteristics for K6 contactor relays

Contactor relay types		**AC operated**	**K6**
Coil operating limits acc. to IEC 60947-4-1		**AC supply**	0.85 ... 1.1 x U_C
AC control voltage			
Coil consumption	Average pull-in value		3.5 VA / 3.5 W
	Average holding value		3.5 VA / 3.5 W
Drop-out voltage in % of U_C min.			Approx. 20 ... 75%

Magnet system characteristics for KC6, TKC6 contactor relays

Contactor relay types		**DC operated**	**KC6**	**TKC6**
Coil operating limits acc. to IEC 60947-5-1		**DC supply**	0.85 ... 1.1 x U_C	See ordering details
DC control voltage				
Coil consumption	Average pull-in value		3.5 VA / 3.5 W	5 VA / 5 W
	Average holding value		3.5 VA / 3.5 W	5 VA / 5 W
Drop-out voltage in % of U_C min.			10 ... 75 %	10 ... 75 %

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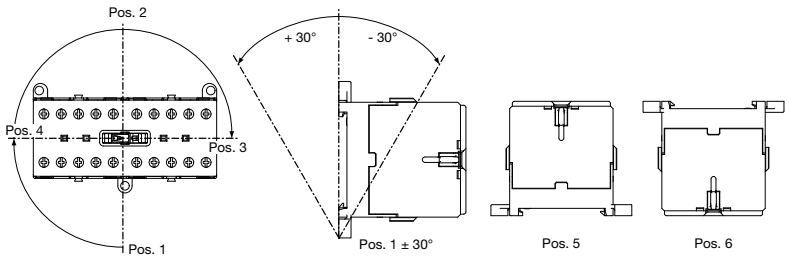
K6, KC6, TKC6 4-pole mini contactor relays
Technical data

Mounting characteristics and conditions for use

Contactor types	**AC operated**	K6
	DC operated	KC6, TKC6
Mounting positions		
Mounting distances		The contactors can be assembled side by side.
Fixing		
On rail acc. to IEC 60715, EN 60715		35 x 7.5 mm or 35 x 15 mm
By screws (not supplied)		2 x M4 screws placed diagonally

Connecting characteristics

Contactor relay types	**AC operated**	K6
	DC operated	KC6, TKC6
Main terminals [1]		Screw terminals with cable clamp
Connection capacity		
Main conductors (poles)		
Rigid: solid	**1 or 2 x**	1 ... 4 mm²
Flexible without ferrule	**1 or 2 x**	1 ... 2.5 mm²
Connection capacity acc. to UL/CSA	**1 or 2 x**	AWG 22 ... 10
Stripping length		9 mm
Tightening torques		0.8 ... 1.1 Nm / 7 lb.in
Degree of protection acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529		
All		IP20
Screw terminals		(Delivered in open position, screws of unused terminals must be tightened)
All terminals		M3
Screwdriver type		Flat Ø 5.5 / Pozidriv 1

[1] Soldering pin connection acc. to DIN 40801: 0.8 x 1 mm / 0.8 x 2.54 mm
Flat pin connection acc. to DIN 46248: 1 x 6.3 mm / 1 x 2.8 mm

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AS contactors
NS contactor relays

3-pole contactors

Overview		**4**/2
AS09 ... AS16	AC operated	**4**/4
ASL09 ... ASL16	DC operated	**4**/5
AS09 ... AS16	AC operated - 2-stack	**4**/6
ASL09 ... ASL16	DC operated - 2-stack	**4**/7
Main accessories		**4**/8
Technical data		**4**/10

3-pole reversing contactors

VAS09 ... VAS16	AC operated	**4**/16
VASL09 ... VASL16	DC operated	**4**/17
Technical data		**4**/18

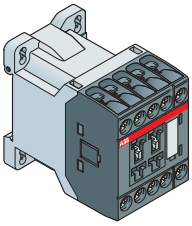
Contactor relays

Overview		**4**/22
NS	AC operated	**4**/24
NSL	DC operated	**4**/25
Main accessories		**4**/26
Technical data		**4**/28

Accessories **4/31**

Voltage coil table **4/37**

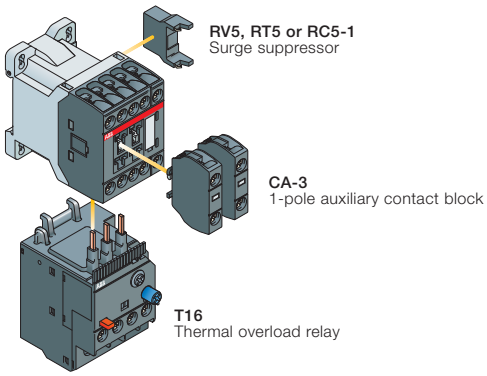
3-pole contactors
Main accessories



AS09 ... AS16
3-pole contactors

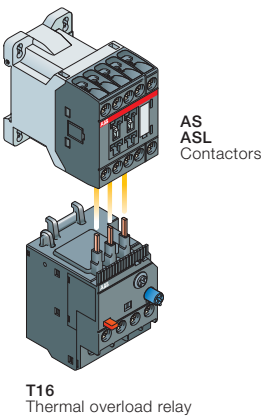
4

Main accessories for contactors

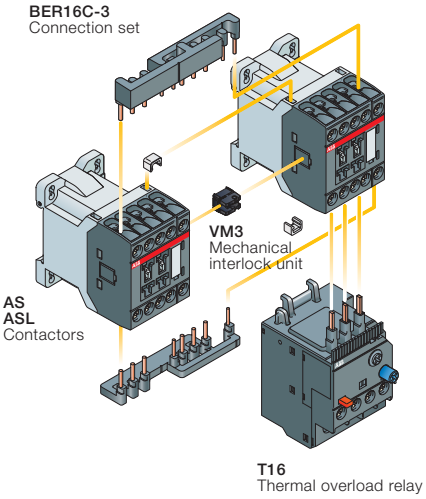


Main accessories for starting solutions

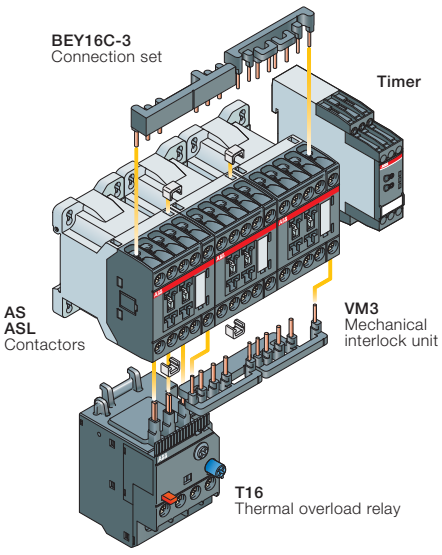
Direct-on-line starter



Reversing starter



Star-delta starter



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3-pole contactors

Screw terminals

	AC control voltage	**AS09**	**AS12**	**AS16**
	DC control voltage	**ASL09**	**ASL12**	**ASL16**

Switching of 3-phase cage motors

	IEC	**AC-3**	Rated operational power		**400 V**	**4 kW**	**5.5 kW**	**7.5 kW**
			Rated operational current	θ ≤ 60 °C	**400 V**	9 A	12 A	15.5 A
				θ ≤ 60 °C	**415 V**	9 A	12 A	15.5 A
				θ ≤ 60 °C	**690 V**	5 A	7 A	9 A
	UL / CSA	**3-phase motor rating**			**440-480 V**	**5 hp**	**7.5 hp**	**10 hp**
	NEMA size					00	00	0

Protection of 3-phase motors

Thermal overload relays		**T16...**				
		0.10...**0.13**	0.23...**0.31**	0.55...**0.74**	1.30...**1.70**	3.10...**4.20**	7.60...**10.0**
		0.13...**0.17**	0.31...**0.41**	0.74...**1.00**	1.70...**2.30**	4.20...**5.70**	10.0...**13.0**
		0.17...**0.23**	0.41...**0.55**	1.00...**1.30**	2.30...**3.10**	5.70...**7.60**	13.0...**16.0**

Switching of resistive circuits

	IEC	**AC-1**	Rated operational current	θ ≤ 40 °C	**690 V**	**22 A**	**24 A**	**24 A**
				θ ≤ 60 °C	**690 V**	18 A	20 A	20 A
				θ ≤ 70 °C	**690 V**	15 A	16 A	16 A
		With conductor cross-sectional area				2.5 mm²	2.5 mm²	2.5 mm²
	UL / CSA	**General use rating**	600 V AC			**20 A**	**20 A**	**20 A**
		With conductor cross-sectional area				AWG 12	AWG 12	AWG 12

Main accessories

Auxiliary contact blocks	Front mounting		1-pole **CA3-10** or **CA3-01**
Interlocks	Mechanical		**VM3**
Surge suppressors	Side-mounted (without additional width)		**RV5** (Varistor) AC / DC **RC5-1** (Capacitor) AC **RT5** (Transil diode) DC
Connection sets	Reversing starters Star-delta starters		**BER16C-3** **BEY16C-3**
Connecting link	With manual motor starter		**BEA16-3**

1SBC101292S0201

AS09 ... AS16 3-pole contactors
4 to 7.5 kW
AC operated

AS09-30-10

Description

AS09 ... AS16 contactors are mainly used for controlling 3-phase motors and power circuits up to 690 V AC and 220 V DC.

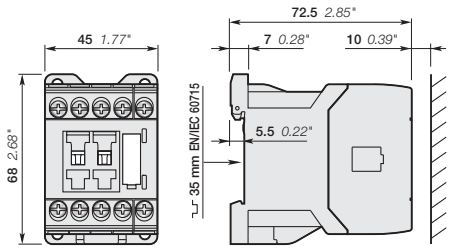
These contactors are of the block type design with:
- 3 main poles and 1 built-in auxiliary contact
- control circuit: AC operated
- add-on auxiliary contact blocks for front mounting and a comprehensive range of accessories.

Ordering details

IEC Rated operational power 400 V AC-3 kW	current θ≤ 40 °C AC-1 A	UL/CSA 3-phase motor rating 480 V hp	General use rating 600 V AC A	Rated control circuit voltage Uc (1) V 50 Hz	V 60 Hz	Auxiliary contacts fitted		Type	Order code		Weight Pkg (1 pce) kg
4	22	5	20	24	24	1	0	AS09-30-10-20	1SBL101001R2010		0.220
						0	1	AS09-30-01-20	1SBL101001R2001		0.220
				-	120	1	0	AS09-30-10-16	1SBL101001R1610		0.220
						0	1	AS09-30-01-16	1SBL101001R1601		0.220
				230	230	1	0	AS09-30-10-26	1SBL101001R2610		0.220
						0	1	AS09-30-01-26	1SBL101001R2601		0.220
				400	400	1	0	AS09-30-10-28	1SBL101001R2810		0.220
						0	1	AS09-30-01-28	1SBL101001R2801		0.220
5.5	24	7.5	20	24	24	1	0	AS12-30-10-20	1SBL111001R2010		0.220
						0	1	AS12-30-01-20	1SBL111001R2001		0.220
				-	120	1	0	AS12-30-10-16	1SBL111001R1610		0.220
						0	1	AS12-30-01-16	1SBL111001R1601		0.220
				230	230	1	0	AS12-30-10-26	1SBL111001R2610		0.220
						0	1	AS12-30-01-26	1SBL111001R2601		0.220
				400	400	1	0	AS12-30-10-28	1SBL111001R2810		0.220
						0	1	AS12-30-01-28	1SBL111001R2801		0.220
7.5	24	10	20	24	24	1	0	AS16-30-10-20	1SBL121001R2010		0.220
						0	1	AS16-30-01-20	1SBL121001R2001		0.220
				-	120	1	0	AS16-30-10-16	1SBL121001R1610		0.220
						0	1	AS16-30-01-16	1SBL121001R1601		0.220
				230	230	1	0	AS16-30-10-26	1SBL121001R2610		0.220
						0	1	AS16-30-01-26	1SBL121001R2601		0.220
				400	400	1	0	AS16-30-10-28	1SBL121001R2810		0.220
						0	1	AS16-30-01-28	1SBL121001R2801		0.220

Note: for multiple packaging, please contact your ABB local sales organization.
(1) Other control voltages see voltage code table.

Main dimensions mm, *inches*



AS09, AS12, AS16

1SBC101301S0201

ASL09 ... ASL16 3-pole contactors
4 to 7.5 kW
DC operated

ASL09-30-10

Description

ASL09 ... ASL16 contactors are mainly used for controlling 3-phase motors and power circuits up to 690 V AC and 220 V DC.

These contactors are of the block type design with:

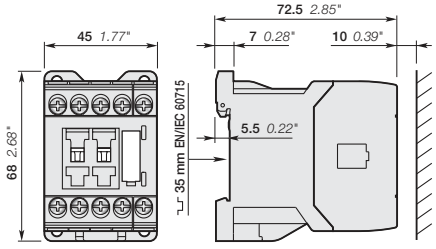
– 3 main poles and 1 built-in auxiliary contact
– control circuit: low consumption (3 W at pull-in and holding) DC operated with solid core magnet. Suitable for direct control by PLC outputs (the polarity on the coil terminals A1+ and A2- must be respected)
– add-on auxiliary contact blocks for front mounting and a comprehensive range of accessories.

Ordering details

IEC		UL/CSA		Rated control circuit voltage Uc (1)	Auxiliary contacts fitted		Type	Order code		Weight
Rated operational power 400 V AC-3	current θ ≤ 40 °C AC-1	3-phase motor rating 480 V	General use rating 600 V AC							Pkg (1 pce)
kW	A	hp	A	V DC						kg
4	22	5	20	24	1	0	ASL09-30-10-81	1SBL103001R8110		0.280
					0	1	ASL09-30-01-81	1SBL103001R8101		0.280
				48	1	0	ASL09-30-10-83	1SBL103001R8310		0.280
					0	1	ASL09-30-01-83	1SBL103001R8301		0.280
				110	1	0	ASL09-30-10-86	1SBL103001R8610		0.280
					0	1	ASL09-30-01-86	1SBL103001R8601		0.280
				220	1	0	ASL09-30-10-88	1SBL103001R8810		0.280
					0	1	ASL09-30-01-88	1SBL103001R8801		0.280
5.5	24	7.5	20	24	1	0	ASL12-30-10-81	1SBL113001R8110		0.280
					0	1	ASL12-30-01-81	1SBL113001R8101		0.280
				48	1	0	ASL12-30-10-83	1SBL113001R8310		0.280
					0	1	ASL12-30-01-83	1SBL113001R8301		0.280
				110	1	0	ASL12-30-10-86	1SBL113001R8610		0.280
					0	1	ASL12-30-01-86	1SBL113001R8601		0.280
				220	1	0	ASL12-30-10-88	1SBL113001R8810		0.280
					0	1	ASL12-30-01-88	1SBL113001R8801		0.280
7.5	24	10	20	24	1	0	ASL16-30-10-81	1SBL123001R8110		0.280
					0	1	ASL16-30-01-81	1SBL123001R8101		0.280
				48	1	0	ASL16-30-10-83	1SBL123001R8310		0.280
					0	1	ASL16-30-01-83	1SBL123001R8301		0.280
				110	1	0	ASL16-30-10-86	1SBL123001R8610		0.280
					0	1	ASL16-30-01-86	1SBL123001R8601		0.280
				220	1	0	ASL16-30-10-88	1SBL123001R8810		0.280
					0	1	ASL16-30-01-88	1SBL123001R8801		0.280

Note: for multiple packaging, please contact your ABB local sales organization.
(1) Other control voltages see voltage code table.

Main dimensions mm, *inches*



ASL09, ASL12, ASL16

AS09 ... AS16 2-stack 3-pole contactors
4 to 7.5 kW
AC operated

AS09-30-32

4

Description

AS09 ... AS16 contactors are mainly used for controlling 3-phase motors and power circuits up to 690 V AC and 220 V DC.

These contactors are of the block type design with:

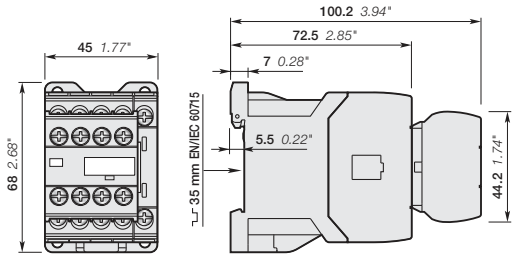
– 1st stack with 3 main poles and 1 N.O. built-in auxiliary contact
– 2nd stack with permanently fixed 2 N.O. + 2 N.C. auxiliary contact block. The auxiliary contact elements are mechanically linked (side-marked symbol) and the N.C. auxiliary contacts are mirror contacts
– control circuit: AC operated
– a comprehensive range of accessories.

Ordering details

IEC		UL/CSA		Rated control circuit voltage Uc (1)		Auxiliary contacts fitted		Type	Order code		Weight
Rated operational power 400 V AC-3	current θ ≤ 40 °C AC-1	3-phase motor rating 480 V	General use rating 600 V AC								Pkg (1 pce)
kW	A	hp	A	V 50 Hz	V 60 Hz						kg
4	22	5	20	24	24	3	2	AS09-30-32-20	1SBL101001R2032		0.260
				-	120	3	2	AS09-30-32-16	1SBL101001R1632		0.260
				230	230	3	2	AS09-30-32-26	1SBL101001R2632		0.260
				400	400	3	2	AS09-30-32-28	1SBL101001R2832		0.260
5.5	24	7.5	20	24	24	3	2	AS12-30-32-20	1SBL111001R2032		0.260
				-	120	3	2	AS12-30-32-16	1SBL111001R1632		0.260
				230	230	3	2	AS12-30-32-26	1SBL111001R2632		0.260
				400	400	3	2	AS12-30-32-28	1SBL111001R2832		0.260
7.5	24	10	20	24	24	3	2	AS16-30-32-20	1SBL121001R2032		0.260
				-	120	3	2	AS16-30-32-16	1SBL121001R1632		0.260
				230	230	3	2	AS16-30-32-26	1SBL121001R2632		0.260
				400	400	3	2	AS16-30-32-28	1SBL121001R2832		0.260

Note: for multiple packaging, please contact your ABB local sales organization.
(1) Other control voltages see voltage code table.

Main dimensions mm, *inches*



AS09, AS12, AS16

1SBC101303S0201

ASL09 ... ASL16 2-stack 3-pole contactors
4 to 7.5 kW
DC operated

ASL09-30-32

Description

ASL09 ... ASL16 contactors are mainly used for controlling 3-phase motors and power circuits up to 690 V AC and 220 V DC.

These contactors are of the block type design with:

– 1st stack with 3 main poles and 1 N.O. built-in auxiliary contact
– 2nd stack with permanently fixed 2 N.O. + 2 N.C. auxiliary contact block. The auxiliary contact elements are mechanically linked (side-marked symbol) and the N.C. auxiliary contacts are mirror contacts
– control circuit: low consumption (3 W at pull-in and holding) DC operated with solid core magnet. Suitable for direct control by PLC outputs (the polarity on the coil terminals A1+ and A2- must be respected)
– a comprehensive range of accessories.

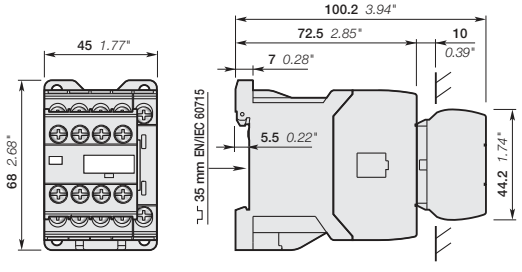
4

Ordering details

IEC		UL/CSA		Rated control circuit voltage Uc (1)	Auxiliary contacts fitted		Type	Order code		Weight
Rated operational power 400 V AC-3	current θ ≤ 40 °C AC-1	3-phase motor rating 480 V	General use rating 600 V AC							Pkg (1 pce)
kW	A	hp	A	V DC						kg
4	22	5	20	24	3	2	ASL09-30-32-81	1SBL103001R8132		0.320
				48	3	2	ASL09-30-32-83	1SBL103001R8332		0.320
				110	3	2	ASL09-30-32-86	1SBL103001R8632		0.320
				220	3	2	ASL09-30-32-88	1SBL103001R8832		0.320
5.5	24	7.5	20	24	3	2	ASL12-30-32-81	1SBL113001R8132		0.320
				48	3	2	ASL12-30-32-83	1SBL113001R8332		0.320
				110	3	2	ASL12-30-32-86	1SBL113001R8632		0.320
				220	3	2	ASL12-30-32-88	1SBL113001R8832		0.320
7.5	24	10	20	24	3	2	ASL16-30-32-81	1SBL123001R8132		0.320
				48	3	2	ASL16-30-32-83	1SBL123001R8332		0.320
				110	3	2	ASL16-30-32-86	1SBL123001R8632		0.320
				220	3	2	ASL16-30-32-88	1SBL123001R8832		0.320

Note: for multiple packaging, please contact your ABB local sales organization.
(1) Other control voltages see voltage code table.

Main dimensions mm, *inches*

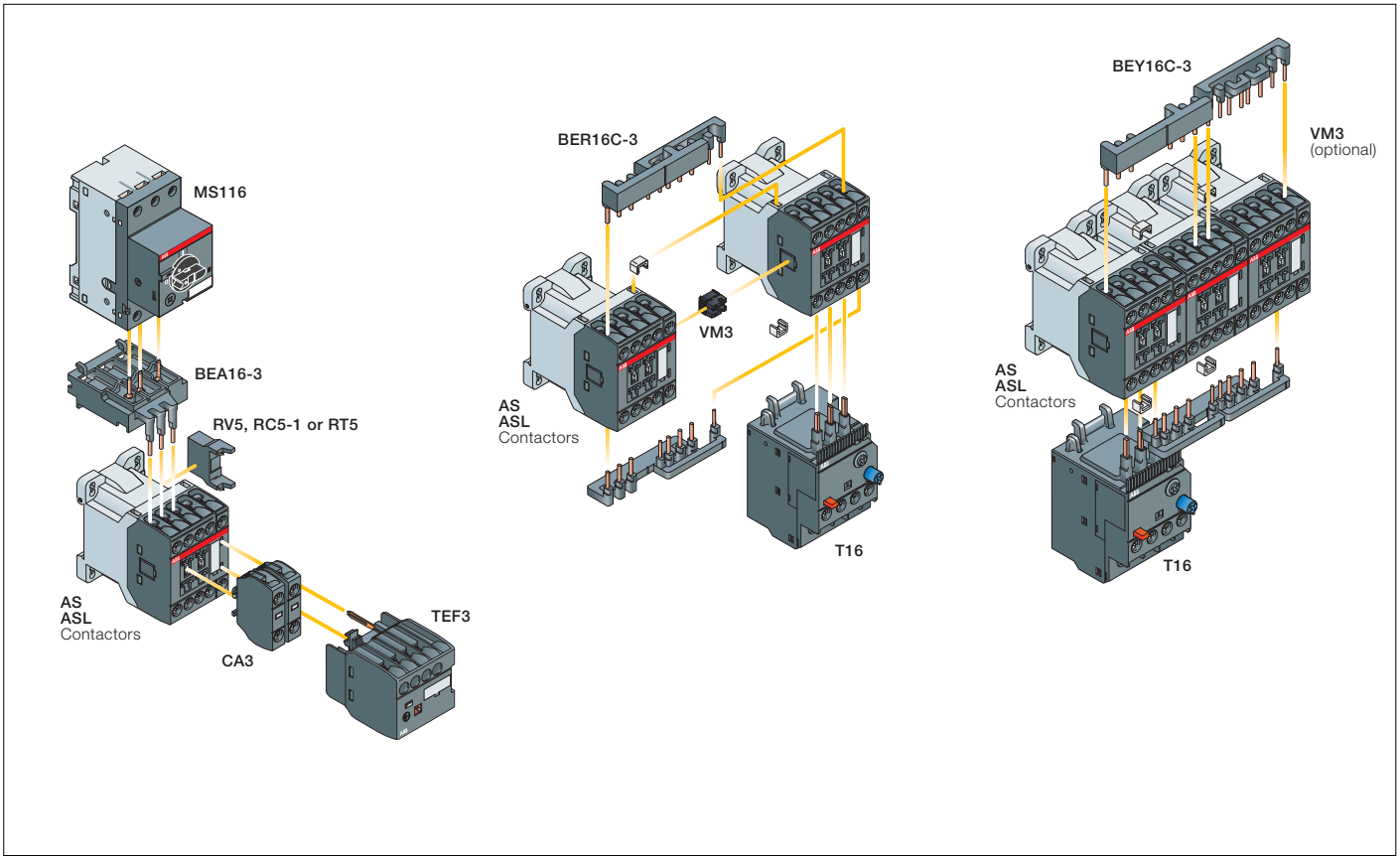


ASL09, ASL12, ASL16

1SBC101453S0201

AS09 ... AS16 and
ASL09 ... ASL16 3-pole contactors
Main accessories

Contactor and main accessories (other accessories available)



Main accessory fitting details

Many configurations of accessories are possible depending on whether these are front-mounted or side-mounted.

Contactor types	Main poles	Built-in auxiliary contacts	Front-mounted accessories						Side-mounted accessories		
			Auxiliary contact blocks		Electronic timer		Mechanical interlock unit (between 2 contactors)				
			1-pole CA3		TEF3		VM3		Surge suppressors		
AS09 ... AS16	3 0 3 0	1 0 0 1	2 max.	or	1	+	1	+	RV5	or	RC5-1
AS09 ... AS16	3 0	3 2	–		–		1	+	RV5	or	RC5-1
ASL09 ... ASL16	3 0 3 0	1 0 0 1	2 max.	or	1	+	1	+	RV5	or	RT5
ASL09 ... ASL16	3 0	3 2	–		–		1	+	RV5	or	RT5

Overload relays fitting details (1)

Contactor types	Thermal overload relays
AS09 ... AS16 ASL09 ... ASL16	T16 (0.10...16 A)

The addition of an overload relay on the contactor does not prevent fitting of many other accessories as shown above.
(1) Direct mounting - No kit required.

1SBC101297S0201

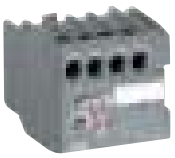
AS09 ... AS16 and ASL09 ... ASL16 3-pole contactors
Main accessories

1SBC101036F0014

CA3-10

Front-mounted instantaneous auxiliary contact blocks

For contactors	Auxiliary contacts		Type	Order code		Pkg qty	Weight (1 pce) kg
AS09 ... AS16	1	0	CA3-10	1SBN011010T1010		10	0.011
ASL09 ... ASL16	0	1	CA3-01	1SBN011010T1001		10	0.011


1SBC101337F0014

TEF3-ON

Front-mounted electronic timer

For contactors	Rated control circuit voltage - Uc V	Type	Order code		Pkg qty	Weight (1 pce) kg
ON-delay						
AS09 ... AS16, ASL09 ... ASL16	24...240 V AC/DC	TEF3-ON	1SBN021012R1000		1	0.065
OFF-delay						
AS09 ... AS16, ASL09 ... ASL16	24...240 V AC/DC	TEF3-OFF	1SBN021014R1000		1	0.065

1SBC101069F0014

VM3

Mechanical interlock unit

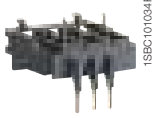
For contactors	Type	Order code		Pkg qty	Weight (1 pce) kg
AS09 ... AS16, ASL09 ... ASL16	VM3	1SBN031005T1000		10	0.002

1SBC574001F0301

RV5

Surge suppressors

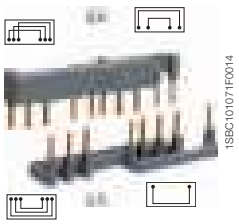
For contactors	Rated control circuit voltage - Uc V	AC	DC	Type	Order code		Pkg qty	Weight (1 pce) kg
AS09 ... AS16, ASL09 ... ASL16	24...50	●	●	RV5/50	1SBN050010R1000		2	0.015
	50...133	●	●	RV5/133	1SBN050010R1001		2	0.015
	110...250	●	●	RV5/250	1SBN050010R1002		2	0.015
	250...440	●	●	RV5/440	1SBN050010R1003		2	0.015
AS09 ... AS16	24...50	●	–	RC5-1/50	1SBN050100R1000		2	0.012
	50...133	●	–	RC5-1/133	1SBN050100R1001		2	0.012
	110...250	●	–	RC5-1/250	1SBN050100R1002		2	0.012
	250...440	●	–	RC5-1/440	1SBN050100R1003		2	0.012
ASL09 ... ASL16	12...32	–	●	RT5/32	1SBN050020R1000		2	0.015
	25...65	–	●	RT5/65	1SBN050020R1001		2	0.015
	50...90	–	●	RT5/90	1SBN050020R1002		2	0.015
	77...150	–	●	RT5/150	1SBN050020R1003		2	0.015
	150...264	–	●	RT5/264	1SBN050020R1004		2	0.015


1SBC101034F0014

BEA16-3

Connecting links with manual motor starters

For contactors	Manual motor starter	Type	Order code		Pkg qty	Weight (1 pce) kg
AS09 ... AS16 ASL09 ... ASL16	MS116-0.16 ... MS116-16 MS132-0.16 ... MS132-16	BEA16-3	1SBN081006T1000		10	0.019

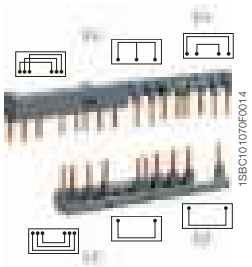

1SBC101071F0014

BER16C-3

Connection sets for reversing contactors

For contactors	Mechanical interlock unit	Type	Order code		Pkg qty	Weight (1 pce) kg
AS09 ... AS16, ASL09 ... ASL16	with or without VM3	BER16C-3	1SBN081012R1000		1	0.035

Note: BER16C-3 connection set includes two BB3 fixing clips, and an electrical interlocking when fitted on contactors with built-in N.C. auxiliary contacts. BER16C-3 can be used with or without VM3 mechanical interlock unit.


1SBC101070F0014

BEY16C-3

Connection sets for star-delta starting

For contactors	Mech. interlock unit between Star & Delta contactors	Type	Order code		Pkg qty	Weight (1 pce) kg
AS09 ... AS12, ASL09 ... ASL12	with or without VM3	BEY16C-3	1SBN081018R2000		1	0.041

Note: BEY16C-3 connection set includes two BB3 fixing clips, and an electrical interlocking when fitted on Star and Delta contactors with built-in N.C. auxiliary contacts. BEY16C-3 can be used with or without VM3 mechanical interlock unit.

1SBC101297S0201

AS09 ... AS16 and
ASL09 ... ASL16 3-pole contactors
Technical data

Main pole - Utilization characteristics according to IEC

Contactor types	AC operated	AS09	AS12	AS16
	DC operated	ASL09	ASL12	ASL16
Standards		IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1		
Rated operational voltage Ue max.		690 V		
Rated frequency (without derating)		50 / 60 Hz		
Conventional free-air thermal current Ith				
acc. to IEC 60947-4-1, open contactors, θ ≤ 40 °C		22 A	25 A	25 A
With conductor cross-sectional area		2.5 mm²	4 mm²	4 mm²
AC-1 Utilization category				
For air temperature close to contactor				
Ie / Rated operational current AC-1	θ ≤ 40 °C	22 A	24 A	24 A
Ue max. ≤ 690 V, 50/60 Hz	θ ≤ 60 °C	18 A	20 A	20 A
	θ ≤ 70 °C	15 A	16 A	16 A
With conductor cross-sectional area		2.5 mm²		
AC-3 Utilization category				
For air temperature close to contactor θ ≤ 60 °C				
Ie / Max. rated operational current AC-3 (1)				
	220-230-240 V	9 A	12 A	15.7 A
3-phase motors	400 V	9 A	12 A	15.5 A
	415 V	9 A	12 A	15.5 A
	440 V	8 A	11 A	13.6 A
	500 V	8 A	11 A	12.5 A
	690 V	5 A	7 A	9 A
Rated operational power AC-3 (1)				
	220-230-240 V	2.2 kW	3 kW	4 kW
1500 r.p.m. 50 Hz 1800 r.p.m. 60 Hz 3-phase motors	400 V	4 kW	5.5 kW	7.5 kW
	415 V	4 kW	5.5 kW	7.5 kW
	440 V	4 kW	5.5 kW	7.5 kW
	500 V	4 kW	5.5 kW	7.5 kW
	690 V	4 kW	5.5 kW	7.5 kW
Rated making capacity AC-3		10 x Ie AC-3 acc. to IEC 60947-4-1		
Rated breaking capacity AC-3		8 x Ie AC-3 acc. to IEC 60947-4-1		
AC-8a Utilization category				
(without thermal overload relay - Ue 400 V 50/60 Hz - θ ≤ 40 °C)				
Ie / Rated operational current AC-8a		12 A	16 A	22 A
Rated operational power AC-8a		5.5 kW	7.5 kW	11 kW
Short-circuit protection device for contactors				
without thermal overload relay - Motor protection excluded (2)				
Ue ≤ 500 V AC - gG type fuse		25 A		
Rated short-time withstand current Icw	1 s	230 A	250 A	250 A
at 40 °C ambient temperature,	10 s	100 A	124 A	124 A
in free air from a cold state	30 s	65 A	75 A	75 A
	1 min	50 A	55 A	55 A
	15 min	22 A	24 A	24 A
Maximum breaking capacity				
cos φ = 0.45	at 440 V	155 A		
	at 690 V	90 A		
Power dissipation per pole	Ie / AC-1	1 W	1.2 W	1.2 W
	Ie / AC-3	0.16 W	0.3 W	0.5 W
Max. electrical switching frequency	AC-1	600 cycles/h		
	AC-3	1200 cycles/h		
	AC-4	300 cycles/h		

(1) For the corresponding kW/A or hp/A values of 1500 r.p.m, 50 Hz or 1800 r.p.m, 60 Hz, 3-phase motors, see "Motor rated operational powers and currents".

(2) For the protection of motor starters against short circuits, see "Coordination with short-circuit protection devices".

1SBC101489S0201

AS09 ... AS16 and ASL09 ... ASL16 3-pole contactors
Technical data

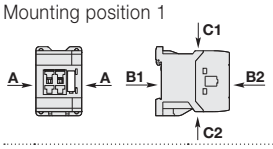
Main pole - Utilization characteristics according to UL / NEMA / CSA

Contactor types	AC operated	AS09	AS12	AS16
	DC operated	ASL09	ASL12	ASL16
Standards		UL 508, CSA C22.2 N°14		
Max. operational voltage		690 V		
NEMA size		00	00	0
NEMA continuous amp rating	Thermal current	9 A	9 A	18 A
NEMA maximum horse power ratings 1-phase, 60 Hz	115 V AC	1/3 hp	1/3 hp	1 hp
	230 V AC	1 hp	1 hp	2 hp
NEMA maximum horse power ratings 3-phase, 60 Hz	200 V AC	1 1/2 hp	1 1/2 hp	3 hp
	230 V AC	1 1/2 hp	1 1/2 hp	3 hp
	460 V AC	2 hp	2 hp	5 hp
	575 V AC	2 hp	2 hp	5 hp
UL / CSA general use rating				
600 V AC		20 A	20 A	20 A
With conductor cross-sectional area		AWG 12	AWG 12	AWG 12
UL / CSA maximum 1-phase motor rating				
Full load current	120 V AC	7.2 A	9.8 A	13.8 A
	240 V AC	8 A	10 A	12 A
Horse power rating	120 V AC	1/3 hp	1/2 hp	3/4 hp
	240 V AC	1 hp	1-1/2 hp	2 hp
UL / CSA maximum 3-phase motor rating				
Full load current (1)	200-208 V AC	7.8 A	7.8 A	11 A
	220-240 V AC	6.8 A	9.6 A	15.2 A
	440-480 V AC	7.6 A	11 A	14 A
	550-600 V AC	9 A	11 A	11 A
Horse power rating (1)	200-208 V AC	2 hp	2 hp	3 hp
	220-240 V AC	2 hp	3 hp	5 hp
	440-480 V AC	5 hp	7-1/2 hp	10 hp
	550-600 V AC	7-1/2 hp	10 hp	10 hp
Short-circuit protection device for contactors without thermal overload relay - Motor protection excluded				
Fuse rating		40 A	50 A	60 A
Fuse type, 600 V		J		
Max. electrical switching frequency				
For general use		600 cycles/h		
For motor use		1200 cycles/h		

(1) For the corresponding kW/A or hp/A values of 1500 r.p.m, 50 Hz or 1800 r.p.m, 60 Hz, 3-phase motors, see "Motor rated operational powers and currents".

General technical data

Contactor types	AC operated	AS09	AS12	AS16
	DC operated	ASL09	ASL12	ASL16
Rated insulation voltage Ui				
acc. to IEC 60947-4-1		690 V		
acc. to UL / CSA		600 V		
Rated impulse withstand voltage Uimp.		6 kV		
Ambient air temperature close to contactor				
Operation	Fitted with thermal overload relay	-25...+60 °C		
	Without thermal overload relay	-40...+70 °C		
Storage		-60...+80 °C		
Climatic withstand		Category B according to IEC 60947-1 Annex Q		
Maximum operating altitude (without derating)		3000 m		
Mechanical durability				
Number of operating cycles		10 millions operating cycles		
Max. switching frequency		3600 cycles/h		
Shock withstand		1/2 sinusoidal shock for 11 ms: no change in contact position, closed or open position		
acc. to IEC 60068-2-27 and EN 60068-2-27	Shock direction	AS contactors - AC operated	ASL contactors - DC operated	
Mounting position 1	A	20 g	20 g closed position / 10 g open position	
	B1	10 g closed position / 5 g open position	15 g closed position / 5 g open position	
	B2	15 g	10 g	
	C1	20 g closed position / 9 g open position	15 g closed position / 8 g open position	
	C2	20 g closed position / 14 g open position	14 g closed position / 8 g open position	
Vibration withstand acc. to IEC 60068-2-6		5...300 Hz / 3 g closed position / 2 g open position		



1SBC101489S0201

AS09 ... AS16 and
ASL09 ... ASL16 3-pole contactors
Technical data

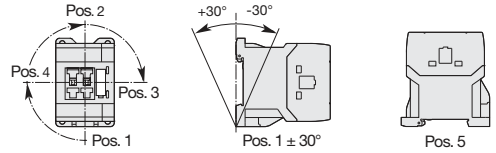
Magnet system characteristics for AS09 ... AS16 contactors

Contactor types		AC operated	AS09	AS12	AS16
Coil operating limits		AC supply			
acc. to IEC 60947-4-1			0.85...1.1 x Uc (at θ ≤ 60 °C); Uc (at θ ≤ 70 °C)		
AC control voltage	Rated control circuit voltage Uc	at 50 Hz	24...415 V		
		at 60 Hz	24...415 V		
	Coil consumption	Average pull-in value 50 Hz	33 VA		
		60 Hz	33 VA		
		50/60 Hz	33 VA		
		Average holding value 50 Hz	6.5 VA / 1.5 W		
		60 Hz	5 VA / 1.2 W		
		50/60 Hz	6.5 VA / 1.5 W		
Drop-out voltage			Approx. 30...50 % of Uc		
Operating time					
	Between coil energization and:	N.O. contact closing	9...24 ms		
		N.C. contact opening	6...18 ms		
	Between coil de-energization and:	N.O. contact opening (1)	5...19 ms		
		N.C. contact closing (1)	7...22 ms		
			(1) The use of RC5-1 surge suppressor increases opening time by a factor of 2 to 3		

Magnet system characteristics for ASL09 ... ASL16 contactors

Contactor types		DC operated	ASL09	ASL12	ASL16
Coil operating limits		DC supply			
acc. to IEC 60947-4-1			0.85...1.1 x Uc (at θ ≤ 60 °C); Uc (at θ ≤ 70 °C)		
DC control voltage	Rated control circuit voltage Uc		12...240 V DC		
	Coil consumption	Average pull-in value	3 W		
		Average holding value	3 W		
Drop-out voltage			Approx. 10...40 % of Uc		
Coil time constant	Open	L/R	12 ms		
	Closed	L/R	40 ms		
Operating time					
	Between coil energization and:	N.O. contact closing	36...59 ms		
		N.C. contact opening	31...53 ms		
	Between coil de-energization and:	N.O. contact opening (1)	13...17 ms		
		N.C. contact closing (1)	15...20 ms		
			(1) The use of RT5 surge suppressor increases opening time by a factor of 1.1 to 1.2		

Mounting characteristics and conditions for use

Contactor types		AC operated	AS09	AS12	AS16
		DC operated	ASL09	ASL12	ASL16
Mounting positions					
Mounting distances			The contactors can be assembled side by side.		
Fixing	On rail according to IEC 60715, EN 60715		35 x 7.5 mm or 35 x 15 mm		
	By screws (not supplied)		2 x M4 screws placed diagonally		

1SBC101489S0201

AS09 ... AS16 and
ASL09 ... ASL16 3-pole contactors
Technical data

Connecting characteristics

Contactor types		AC operated	AS09	AS12	AS16
		DC operated	ASL09	ASL12	ASL16
Main terminals			Screw terminals with cable clamp		
Connection capacity (min. ... max.)					
Main conductors (poles)					
Rigid solid		**1 x**	0.75...4 mm²		
		2 x	0.75...4 mm²		
Flexible with non insulated ferrule		**1 x**	0.75...2.5 mm²		
		2 x	0.75...2.5 mm²		
Flexible with insulated ferrule		**1 x**	0.75...2.5 mm²		
		2 x	0.75...1.5 mm²		
Bars or lugs		**L ≤**	7.7 mm		
		I >	3.2 mm		
Connection capacity acc. to UL / CSA		**1 or 2 x**	AWG 18...12		
Stripping length			9 mm		
Tightening torque	Recommended		1.00 Nm / 9 lb.in		
	Max.		1.20 Nm		
Auxiliary conductors					
(built-in auxiliary terminals + coil terminals)					
Rigid solid		**1 x**	0.75...2.5 mm²		
		2 x	0.75...2.5 mm²		
Flexible with non insulated ferrule		**1 x**	0.75...2.5 mm²		
		2 x	0.75...2.5 mm²		
Flexible with insulated ferrule		**1 x**	0.75...2.5 mm²		
		2 x	0.75...1.5 mm²		
Lugs		**L ≤**	7.7 mm		
		I >	3.2 mm		
Connection capacity acc. to UL / CSA		**1 or 2 x**	AWG 18...14		
Stripping length					
Tightening torque					
Coil terminals	Recommended		1.00 Nm / 9 lb.in		
	Max.		1.20 Nm		
Built-in auxiliary terminals	Recommended		1.00 Nm / 9 lb.in		
	Max.		1.20 Nm		
Degree of protection					
acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529					
All terminals			IP20		
Screw terminals			Delivered in open position, screws of unused terminals must be tightened		
All terminals			M3		
		Screwdriver type	Flat Ø 5.5 / Pozidriv 2		

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AS09 ... AS16 and
ASL09 ... ASL16 3-pole contactors
Technical data

Built-in auxiliary contacts according to IEC

Contactor types	AC operated	AS09	AS12	AS16
	DC operated	ASL09	ASL12	ASL16
Rated operational voltage Ue max.		690 V		
Rated frequency (without derating)		50 / 60 Hz		
Conventional free-air thermal current Ith - θ ≤ 40 °C		10 A		
Ie / Rated operational current AC-15				
acc. to IEC 60947-5-1	24-127 V 50/60 Hz	6 A		
	220-240 V 50/60 Hz	4 A		
	400-440 V 50/60 Hz	3 A		
	500 V 50/60 Hz	2 A		
	690 V 50/60 Hz	2 A		
Making capacity AC-15		10 x Ie AC-15 acc. to IEC 60947-5-1		
Breaking capacity AC-15		10 x Ie AC-15 acc. to IEC 60947-5-1		
Ie / Rated operational current DC-13				
acc. to IEC 60947-5-1	24 V DC	6 A / 144 W		
	48 V DC	2.8 A / 134 W		
	72 V DC	1 A / 72 W		
	110 V DC	0.55 A / 60 W		
	125 V DC	0.55 A / 69 W		
	220 V DC	0.27 A / 60 W		
	250 V DC	0.27 A / 68 W		
Short-circuit protection device gG type fuse		10 A		
Rated short-time withstand current Icw	for 1.0 s	100 A		
	for 0.1 s	140 A		
Minimum switching capacity		12 V / 3 mA		
with failure rate acc. to IEC 60947-5-4		10^{-7}		
Non-overlapping time between N.O. and N.C. contacts		1.5 ms		
Power dissipation per pole at 6 A		0.1 W		
Max. electrical switching frequency	AC-15	1200 cycles/h		
	DC-13	900 cycles/h		
Mechanically linked contacts acc. to annex L of IEC 60947-5-1		Built-in N.O. or N.C. auxiliary contacts and additional N.O. or N.C. auxiliary contacts (CA3 aux. contact blocks) are mechanically linked contacts.		
Mirror contacts acc. to annex F of IEC 60947-4-1		Built-in N.C. auxiliary contacts or additional N.C. auxiliary contacts (CA3 aux. contact blocks) are mirror contacts.		

Built-in auxiliary contacts according to UL / CSA

Contactor types	AC operated	AS09	AS12	AS16
	DC operated	ASL09	ASL12	ASL16
Max. operational voltage		600 V AC, 250 V DC		
Pilot duty		A600, Q300		
AC thermal rated current		10 A		
AC maximum volt-ampere making		7200 VA		
AC maximum volt-ampere breaking		720 VA		
DC thermal rated current		2.5 A		
DC maximum volt-ampere making-breaking		69 VA		

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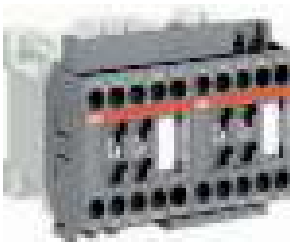
Notes

VAS09 ... VAS16 3-pole reversing contactors
4 to 7.5 kW
AC operated



VAS09EM

4

Description

VAS09 ... VAS16 reversing contactors are used for controlling 3-phase motors up to 690 V AC.
These reversing contactors include 2 AS09 ... AS16 contactors fitted with 1 N.C. auxiliary contact, 1 VM3 mechanical interlock and BER16C-3 reversing connection set including electrical interlocking.

Up to 2 add-on CA3 1-pole auxiliary contact blocks can be mounted per contactor.

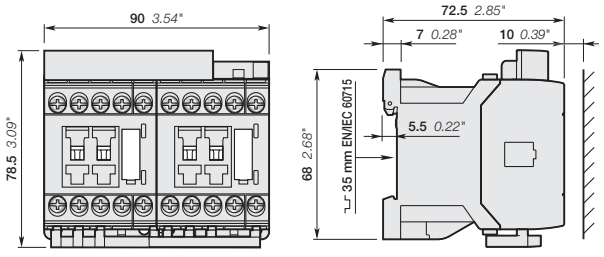
The reversing contactors are available with or without surge suppressor mounted on each contactor.

Ordering details

IEC Rated operational power 400 V AC-3 kW	UL/CSA 3-phase motor rating 480 V hp	Rated control circuit voltage Uc (1) V 50 Hz	V 60 Hz	Auxiliary contacts fitted	Type	Order code		Pkg qty	Weight (1 pce) kg
Reversing contactors without integrated surge suppressor									
4	5	24	24	0 2	VAS09EM-20M	1SBK103600M2000		18	0.480
		-	120	0 2	VAS09EM-16M	1SBK103600M1600		18	0.480
		230	230	0 2	VAS09EM-26M	1SBK103600M2600		18	0.480
		400	400	0 2	VAS09EM-28M	1SBK103600M2800		18	0.480
5.5	7.5	24	24	0 2	VAS12EM-20M	1SBK113600M2000		18	0.480
		-	120	0 2	VAS12EM-16M	1SBK113600M1600		18	0.480
		230	230	0 2	VAS12EM-26M	1SBK113600M2600		18	0.480
		400	400	0 2	VAS12EM-28M	1SBK113600M2800		18	0.480
7.5	10	24	24	0 2	VAS16EM-20M	1SBK123600M2000		18	0.480
		-	120	0 2	VAS16EM-16M	1SBK123600M1600		18	0.480
		230	230	0 2	VAS16EM-26M	1SBK123600M2600		18	0.480
		400	400	0 2	VAS16EM-28M	1SBK123600M2800		18	0.480
Reversing contactors with RC5-1 integrated surge suppressor									
4	5	24	24	0 2	VAS09SEM-20M	1SBK103800M2000		18	0.510
		-	120	0 2	VAS09SEM-16M	1SBK103800M1600		18	0.510
		230	230	0 2	VAS09SEM-26M	1SBK103800M2600		18	0.510
		400	400	0 2	VAS09SEM-28M	1SBK103800M2800		18	0.510
5.5	7.5	24	24	0 2	VAS12SEM-20M	1SBK113800M2000		18	0.510
		-	120	0 2	VAS12SEM-16M	1SBK113800M1600		18	0.510
		230	230	0 2	VAS12SEM-26M	1SBK113800M2600		18	0.510
		400	400	0 2	VAS12SEM-28M	1SBK113800M2800		18	0.510
7.5	10	24	24	0 2	VAS16SEM-20M	1SBK123800M2000		18	0.510
		-	120	0 2	VAS16SEM-16M	1SBK123800M1600		18	0.510
		230	230	0 2	VAS16SEM-26M	1SBK123800M2600		18	0.510
		400	400	0 2	VAS16SEM-28M	1SBK123800M2800		18	0.510

(1) Other control voltages see voltage code table.
Note: Minimum switchover delay of 50 ms must be introduced between respective opening and closing of AC operated reversing contactors.

Main dimensions mm, *inches*



VAS09, VAS12, VAS16

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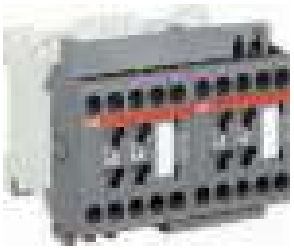
VASL09 ... VASL16 3-pole reversing contactors
4 to 7.5 kW
DC operated



VASL09EM

Description

VASL09 ... VASL16 reversing contactors are used for controlling 3-phase motors up to 690 V AC.

These reversing contactors include 2 ASL09 ... ASL16 contactors fitted with 1 N.C. auxiliary contact, 1 VM3 mechanical interlock and BER16C-3 reversing connection set including electrical interlocking.

Up to 2 add-on CA3 1-pole auxiliary contact blocks can be mounted per contactor.

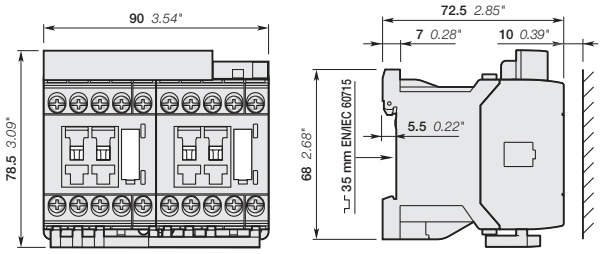
The reversing contactors are available with or without surge suppressor mounted on each contactor.

Ordering details

IEC Rated operational power 400 V AC-3 kW	UL/CSA 3-phase motor rating 480 V hp	Rated control circuit voltage Uc (1) V DC	Auxiliary contacts fitted		Type	Order code		Pkg qty	Weight (1 pce) kg
Reversing contactors without integrated surge suppressor									
4	5	24	0	2	VASL09EM-81M	1SBK103700M8100		18	0.600
		48	0	2	VASL09EM-83M	1SBK103700M8300		18	0.600
		110	0	2	VASL09EM-86M	1SBK103700M8600		18	0.600
		220	0	2	VASL09EM-88M	1SBK103700M8800		18	0.600
5.5	7.5	24	0	2	VASL12EM-81M	1SBK113700M8100		18	0.600
		48	0	2	VASL12EM-83M	1SBK113700M8300		18	0.600
		110	0	2	VASL12EM-86M	1SBK113700M8600		18	0.600
		220	0	2	VASL12EM-88M	1SBK113700M8800		18	0.600
7.5	10	24	0	2	VASL16EM-81M	1SBK123700M8100		18	0.600
		48	0	2	VASL16EM-83M	1SBK123700M8300		18	0.600
		110	0	2	VASL16EM-86M	1SBK123700M8600		18	0.600
		220	0	2	VASL16EM-88M	1SBK123700M8800		18	0.600
Reversing contactors with RV5 integrated surge suppressor									
4	5	24	0	2	VASL09SEM-81M	1SBK103900M8100		18	0.630
		48	0	2	VASL09SEM-83M	1SBK103900M8300		18	0.630
		110	0	2	VASL09SEM-86M	1SBK103900M8600		18	0.630
		220	0	2	VASL09SEM-88M	1SBK103900M8800		18	0.630
5.5	7.5	24	0	2	VASL12SEM-81M	1SBK113900M8100		18	0.630
		48	0	2	VASL12SEM-83M	1SBK113900M8300		18	0.630
		110	0	2	VASL12SEM-86M	1SBK113900M8600		18	0.630
		220	0	2	VASL12SEM-88M	1SBK113900M8800		18	0.630
7.5	10	24	0	2	VASL16SEM-81M	1SBK123900M8100		18	0.630
		48	0	2	VASL16SEM-83M	1SBK123900M8300		18	0.630
		110	0	2	VASL16SEM-86M	1SBK123900M8600		18	0.630
		220	0	2	VASL16SEM-88M	1SBK123900M8800		18	0.630

(1) Other control voltages see voltage code table.

Main dimensions mm, *inches*



VASL09, VASL12, VASL16

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VAS09 ... VAS16 and
VASL09 ... VASL16 3-pole reversing contactors
Technical data

Main pole - Utilization characteristics according to IEC

Contactor types	**AC operated**	**VAS09**	**VAS12**	**VAS16**
	DC operated	**VASL09**	**VASL12**	**VASL16**
Standards		IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1		
Rated operational voltage Ue max.		690 V		
Rated frequency (without derating)		50 / 60 Hz		
Conventional free-air thermal current Ith				
acc. to IEC 60947-4-1, open contactors, θ ≤ 40 °C		22 A	25 A	25 A
With conductor cross-sectional area		2.5 mm²	4 mm²	4 mm²
AC-3 Utilization category				
For air temperature close to contactor θ ≤ 60 °C				
Ie / Max. rated operational current AC-3 (1)				
	220-230-240 V	9 A	12 A	15.7 A
	400 V	9 A	12 A	15.5 A
3-phase motors	**415 V**	9 A	12 A	15.5 A
	440 V	8 A	11 A	13.6 A
	500 V	8 A	11 A	12.5 A
	690 V	5 A	7 A	9 A
Rated operational power AC-3 (1)				
	220-230-240 V	2.2 kW	3 kW	4 kW
	400 V	4 kW	5.5 kW	7.5 kW
1500 r.p.m. 50 Hz 1800 r.p.m. 60 Hz 3-phase motors	**415 V**	4 kW	5.5 kW	7.5 kW
	440 V	4 kW	5.5 kW	7.5 kW
	500 V	4 kW	5.5 kW	7.5 kW
	690 V	4 kW	5.5 kW	7.5 kW
Rated making capacity AC-3		10 x Ie AC-3 acc. to IEC 60947-4-1		
Rated breaking capacity AC-3		8 x Ie AC-3 acc. to IEC 60947-4-1		
Short-circuit protection device for contactors				
without thermal overload relay - Motor protection excluded (2)				
Ue ≤ 500 V AC - gG type fuse		25 A		
Rated short-time withstand current Icw	**1 s**	230 A	250 A	250 A
at 40 °C ambient temperature,	**10 s**	100 A	124 A	124 A
in free air from a cold state	**30 s**	65 A	75 A	75 A
	1 min	50 A	55 A	55 A
	15 min	22 A	24 A	24 A
Maximum breaking capacity				
cos φ = 0.45	**at 440 V**	155 A		
	at 690 V	90 A		
Power dissipation per pole				
	Ie / AC-3	0.16 W	0.3 W	0.5 W
Max. electrical switching frequency	**AC-3**	600 cycles/h		

(1) For the corresponding kW/A or hp/A values of 1500 r.p.m, 50 Hz or 1800 r.p.m, 60 Hz, 3-phase motors, see "Motor rated operational powers and currents".

(2) For the protection of motor starters against short circuits, see "Coordination with short-circuit protection devices".

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VAS09 ... VAS16 and
VASL09 ... VASL16 3-pole reversing contactors
Technical data

Main pole - Utilization characteristics according to UL / NEMA / CSA

Contactor types	AC operated	VAS09	VAS12	VAS16
	DC operated	VASL09	VASL12	VASL16
Standards		UL 508, CSA C22.2 N°14		
Max. operational voltage		690 V		
NEMA size		00	00	0
NEMA continuous amp rating	Thermal current	9 A	9 A	18 A
NEMA maximum horse power ratings 1-phase, 60 Hz	115 V AC	1/3 hp	1/3 hp	1 hp
	230 V AC	1 hp	1 hp	2 hp
NEMA maximum horse power ratings 3-phase, 60 Hz	200 V AC	1 1/2 hp	1 1/2 hp	3 hp
	230 V AC	1 1/2 hp	1 1/2 hp	3 hp
	460 V AC	2 hp	2 hp	5 hp
	575 V AC	2 hp	2 hp	5 hp
UL / CSA maximum 1-phase motor rating				
Full load current	120 V AC	7.2 A	9.8 A	13.8 A
	240 V AC	8 A	10 A	12 A
Horse power rating	120 V AC	1/3 hp	1/2 hp	3/4 hp
	240 V AC	1 hp	1-1/2 hp	2 hp
UL / CSA maximum 3-phase motor rating				
Full load current (1)	200-208 V AC	7.8 A	7.8 A	11 A
	220-240 V AC	6.8 A	9.6 A	15.2 A
	440-480 V AC	7.6 A	11 A	14 A
	550-600 V AC	9 A	11 A	11 A
Horse power rating (1)	200-208 V AC	2 hp	2 hp	3 hp
	220-240 V AC	2 hp	3 hp	5 hp
	440-480 V AC	5 hp	7-1/2 hp	10 hp
	550-600 V AC	7-1/2 hp	10 hp	10 hp
Short-circuit protection device for contactors without thermal overload relay - Motor protection excluded				
Fuse rating		40 A	50 A	60 A
Fuse type, 600 V		J		
Max. electrical switching frequency				
For motor use		600 cycles/h		

(1) For the corresponding kW/A or hp/A values of 1500 r.p.m, 50 Hz or 1800 r.p.m, 60 Hz, 3-phase motors, see "Motor rated operational powers and currents".

General technical data

Contactor types		AC operated	VAS09	VAS12	VAS16
		DC operated	VASL09	VASL12	VASL16
Rated insulation voltage Ui					
acc. to IEC 60947-4-1			690 V		
acc. to UL / CSA			600 V		
Rated impulse withstand voltage Uimp.			6 kV		
Ambient air temperature close to contactor					
Operation	Fitted with thermal overload relay		-25...+60 °C		
	Without thermal overload relay		-40...+70 °C		
Storage			-60...+80 °C		
Climatic withstand			Category B according to IEC 60947-1 Annex Q		
Maximum operating altitude (without derating)			3000 m		
Mechanical durability					
Number of operating cycles			5 millions operating cycles		
Max. switching frequency			1800 cycles/h		

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VAS09 ... VAS16 and VASL09 ... VASL16 3-pole reversing contactors
Technical data

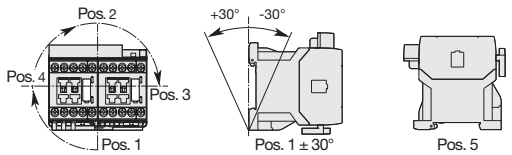
Magnet system characteristics for VAS09 ... VAS16 contactors

Contactor types		**AC operated**	VAS09	VAS12	VAS16
Coil operating limits		**AC supply**			
acc. to IEC 60947-4-1			0.85...1.1 x Uc (at θ ≤ 60 °C); Uc (at θ ≤ 70 °C)		
AC control voltage	Rated control circuit voltage Uc	**at 50 Hz**	24...415 V		
		at 60 Hz	24...415 V		
	Coil consumption	**Average pull-in value 50 Hz**	33 VA		
		60 Hz	33 VA		
		50/60 Hz	33 VA		
		Average holding value 50 Hz	6.5 VA / 1.5 W		
		60 Hz	5 VA / 1.2 W		
		50/60 Hz	6.5 VA / 1.5 W		
Drop-out voltage			Approx. 30...50 % of Uc		
Operating time					
Between coil energization and:		**N.O. contact closing**	9...24 ms		
		N.C. contact opening	6...18 ms		
Between coil de-energization and:		**N.O. contact opening (1)**	5...19 ms		
		N.C. contact closing (1)	7...22 ms		
			(1) The use of RC5-1 surge suppressor increases opening time by a factor of 2 to 3.		

Magnet system characteristics for VASL09 ... VASL16 contactors

Contactor types		**DC operated**	VASL09	VASL12	VASL16
Coil operating limits		**DC supply**			
acc. to IEC 60947-4-1			0.85...1.1 x Uc (at θ ≤ 60 °C); Uc (at θ ≤ 70 °C)		
DC control voltage	Rated control circuit voltage Uc		12...240 V DC		
	Coil consumption	**Average pull-in value**	3 W		
		Average holding value	3 W		
Drop-out voltage			Approx. 10...40 % of Uc		
Coil time constant	Open	**L/R**	12 ms		
	Closed	**L/R**	40 ms		
Operating time					
Between coil energization and:		**N.O. contact closing**	36...59 ms		
		N.C. contact opening	31...53 ms		
Between coil de-energization and:		**N.O. contact opening (1)**	13...17 ms		
		N.C. contact closing (1)	15...20 ms		
			(1) The use of RT5 surge suppressor increases opening time by a factor of 1.1 to 1.2		

Mounting characteristics and conditions for use

Contactor types		**AC operated**	VAS09	VAS12	VAS16
		DC operated	VASL09	VASL12	VASL16
Mounting positions					
Mounting distances			The reversing contactors can be assembled side by side.		
Fixing	On rail according to IEC 60715, EN 60715		35 x 7.5 mm or 35 x 15 mm		
	By screws (not supplied)		2 x M4 screws placed diagonally		

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VAS09 ... VAS16 and
VASL09 ... VASL16 3-pole reversing contactors
Technical data

Connecting characteristics

Contactor types		**AC operated**	VAS09	VAS12	VAS16
		DC operated	VASL09	VASL12	VASL16
Main terminals					
			Screw terminals with cable clamp		
Connection capacity (min. ... max.)					
Main conductors (poles)					
Rigid solid		**1 x**	0.75...4 mm²		
Flexible with non insulated ferrule		**1 x**	0.75...2.5 mm²		
Flexible with insulated ferrule		**1 x**	0.75...1.5 mm²		
Connection capacity acc. to UL / CSA		**1 x**	AWG 18...12		
Stripping length			9 mm		
Tightening torque	Recommended		1.00 Nm / 9 lb.in		
	Max.		1.20 Nm		
Auxiliary conductors					
(built-in auxiliary terminals + coil terminals)					
Rigid solid		**1 x**	0.75...2.5 mm²		
Flexible with non insulated ferrule		**1 x**	0.75...2.5 mm²		
Flexible with insulated ferrule		**1 x**	0.75...1.5 mm²		
Connection capacity acc. to UL / CSA		**1 x**	AWG 18...14		
Stripping length			9 mm		
Tightening torque					
Coil terminals	Recommended		1.00 Nm / 9 lb.in		
	Max.		1.20 Nm		
Built-in auxiliary terminals	Recommended		1.00 Nm / 9 lb.in		
	Max.		1.20 Nm		
Degree of protection					
acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529					
All terminals			IP20		
Screw terminals			Delivered in open position, screws of unused terminals must be tightened		
All terminals			M3		
		Screwdriver type	Flat Ø 5.5 / Pozidriv 2		

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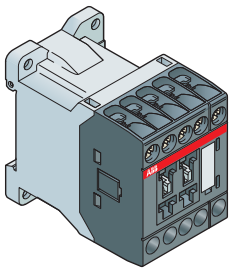
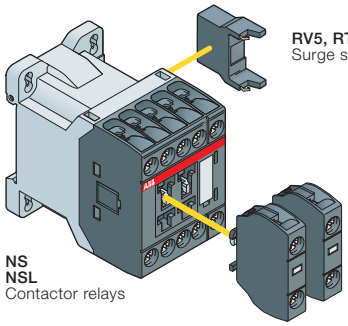
Contactor relays
Main accessories



NS, NSL
Contactor relays

4-pole contactor relays

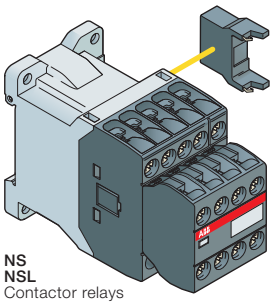


RV5, RT5 or RC5-1
Surge suppressor

CA-3
1-pole auxiliary contact block

NS
NSL
Contactor relays

8-pole contactor relays



RV5, RT5 or RC5-1
Surge suppressor

NS
NSL
Contactor relays

1SBC101409S0201

Contactor relays

Screw terminals

NS

NSL

AC control voltage	NS22E	NS31E	NS40E
DC control voltage	NSL22E	NSL31E	NSL40E
	2 N.O. + 2 N.C.	3 N.O. + 1 N.C.	4 N.O.

NS

NSL

AC control voltage	NS44E	NS53E	NS62E	NS71E	NS80E
DC control voltage	NSL44E	NSL53E	NSL62E	NSL71E	NSL80E
	4 N.O. + 4 N.C.	5 N.O. + 3 N.C.	6 N.O. + 2 N.C.	7 N.O. + 1 N.C.	8 N.O.

Control circuit switching

IEC	Rated operational current		
	AC-15	240 V	4 A
		400 V	3 A
		690 V	2 A
	DC-13	24 V	6 A / 144 W
		250 V	0.27 A / 68 W
UL / CSA	Pilot Duty		A600, Q300

Main accessories

Auxiliary contact blocks	Front mounting		1-pole **CA3-10** or **CA3-01**
Surge suppressors	Side-mounted (without additional width)		**RV5** (Varistor) AC / DC **RC5-1** (Capacitor) AC **RT5** (Transil diode) DC

1SBC101409S0201

NS contactor relays
AC operated

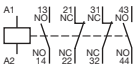
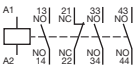
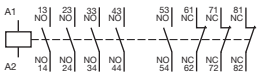
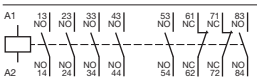
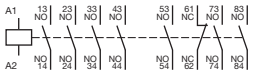
NS22E

4

Description

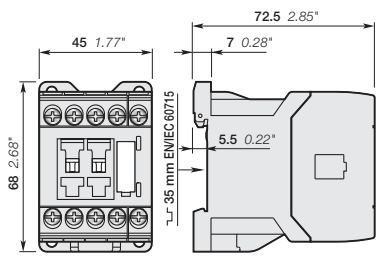
NS contactor relays are used for switching auxiliary and control circuits.
These contactor relays are designed with:
– 4 poles or 8 poles. Contactor relays have mechanically linked auxiliary contact elements (side-marked symbol)
– control circuit: AC operated
– add-on auxiliary contact blocks for front mounting and a comprehensive range of accessories.

Ordering details

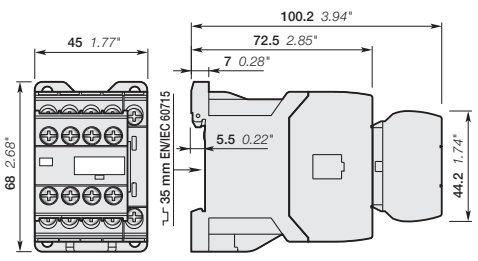
Number of contacts 1st stack	2nd stack	Rated control circuit voltage Uc (1) V 50 Hz	V 60 Hz	Type	Order code		Weight Pkg (1 pce) kg
		24	24	NS22E-20	1SBH101001R2022		0.220
		-	120	NS22E-16	1SBH101001R1622		0.220
		230	230	NS22E-26	1SBH101001R2622		0.220
		400	400	NS22E-28	1SBH101001R2822		0.220
		24	24	NS31E-20	1SBH101001R2031		0.220
		-	120	NS31E-16	1SBH101001R1631		0.220
		230	230	NS31E-26	1SBH101001R2631		0.220
		400	400	NS31E-28	1SBH101001R2831		0.220
		24	24	NS40E-20	1SBH101001R2040		0.220
		-	120	NS40E-16	1SBH101001R1640		0.220
		230	230	NS40E-26	1SBH101001R2640		0.220
		400	400	NS40E-28	1SBH101001R2840		0.220
		24	24	NS44E-20	1SBH101001R2044		0.260
		-	120	NS44E-16	1SBH101001R1644		0.260
		230	230	NS44E-26	1SBH101001R2644		0.260
		400	400	NS44E-28	1SBH101001R2844		0.260
		24	24	NS53E-20	1SBH101001R2053		0.260
		-	120	NS53E-16	1SBH101001R1653		0.260
		230	230	NS53E-26	1SBH101001R2653		0.260
		400	400	NS53E-28	1SBH101001R2853		0.260
		24	24	NS62E-20	1SBH101001R2062		0.260
		-	120	NS62E-16	1SBH101001R1662		0.260
		230	230	NS62E-26	1SBH101001R2662		0.260
		400	400	NS62E-28	1SBH101001R2862		0.260
		24	24	NS71E-20	1SBH101001R2071		0.260
		-	120	NS71E-16	1SBH101001R1671		0.260
		230	230	NS71E-26	1SBH101001R2671		0.260
		400	400	NS71E-28	1SBH101001R2871		0.260
		24	24	NS80E-20	1SBH101001R2080		0.260
		-	120	NS80E-16	1SBH101001R1680		0.260
		230	230	NS80E-26	1SBH101001R2680		0.260
		400	400	NS80E-28	1SBH101001R2880		0.260

Note: for multiple packaging, please contact your ABB local sales organization.
(1) Other control voltages see voltage code table.

Main dimensions mm, *inches*



NS22E, NS31E, NS40E



NS44E, NS53E, NS62E, NS71E, NS80E

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NSL contactor relays
DC operated

NSL22E

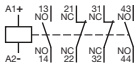
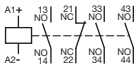
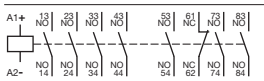
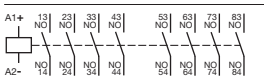
Description

NSL contactor relays are used for switching auxiliary and control circuits.

These contactor relays are designed with:

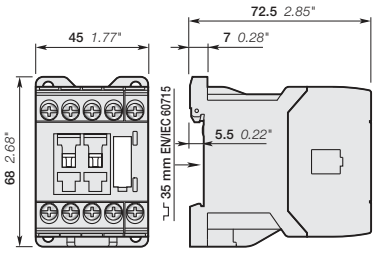
– 4 poles or 8 poles. Contactor relays have mechanically linked auxiliary contact elements (side-marked symbol)
– control circuit: low coil consumption (3 W at pull-in and holding) DC operated with solid core magnet. Suitable for direct control by PLC outputs (the polarity on the coil terminals A1+ and A2- must be respected)
– add-on auxiliary contact blocks for front mounting and a comprehensive range of accessories.

Ordering details

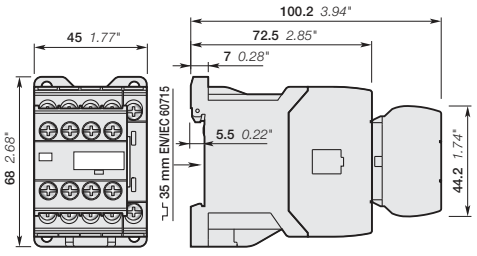
Number of contacts 1st stack	2nd stack	Rated control circuit voltage Uc (1) V DC	Type	Order code	Weight Pkg (1 pce) kg
		24	NSL22E-81	1SBH103001R8122	0.280
		48	NSL22E-83	1SBH103001R8322	0.280
		110	NSL22E-86	1SBH103001R8622	0.280
		220	NSL22E-88	1SBH103001R8822	0.280
		24	NSL31E-81	1SBH103001R8131	0.280
		48	NSL31E-83	1SBH103001R8331	0.280
		110	NSL31E-86	1SBH103001R8631	0.280
		220	NSL31E-88	1SBH103001R8831	0.280
		24	NSL40E-81	1SBH103001R8140	0.280
		48	NSL40E-83	1SBH103001R8340	0.280
		110	NSL40E-86	1SBH103001R8640	0.280
		220	NSL40E-88	1SBH103001R8840	0.280
		24	NSL44E-81	1SBH103001R8144	0.320
		48	NSL44E-83	1SBH103001R8344	0.320
		110	NSL44E-86	1SBH103001R8644	0.320
		220	NSL44E-88	1SBH103001R8844	0.320
		24	NSL53E-81	1SBH103001R8153	0.320
		48	NSL53E-83	1SBH103001R8353	0.320
		110	NSL53E-86	1SBH103001R8653	0.320
		220	NSL53E-88	1SBH103001R8853	0.320
		24	NSL62E-81	1SBH103001R8162	0.320
		48	NSL62E-83	1SBH103001R8362	0.320
		110	NSL62E-86	1SBH103001R8662	0.320
		220	NSL62E-88	1SBH103001R8862	0.320
		24	NSL71E-81	1SBH103001R8171	0.320
		48	NSL71E-83	1SBH103001R8371	0.320
		110	NSL71E-86	1SBH103001R8671	0.320
		220	NSL71E-88	1SBH103001R8871	0.320
		24	NSL80E-81	1SBH103001R8180	0.320
		48	NSL80E-83	1SBH103001R8380	0.320
		110	NSL80E-86	1SBH103001R8680	0.320
		220	NSL80E-88	1SBH103001R8880	0.320

Note: for multiple packaging, please contact your ABB local sales organization.
(1) Other control voltages see voltage code table.

Main dimensions mm, *inches*



NSL22E, NSL31E, NSL40E



NSL44E, NSL53E, NSL62E, NSL71E, NSL80E

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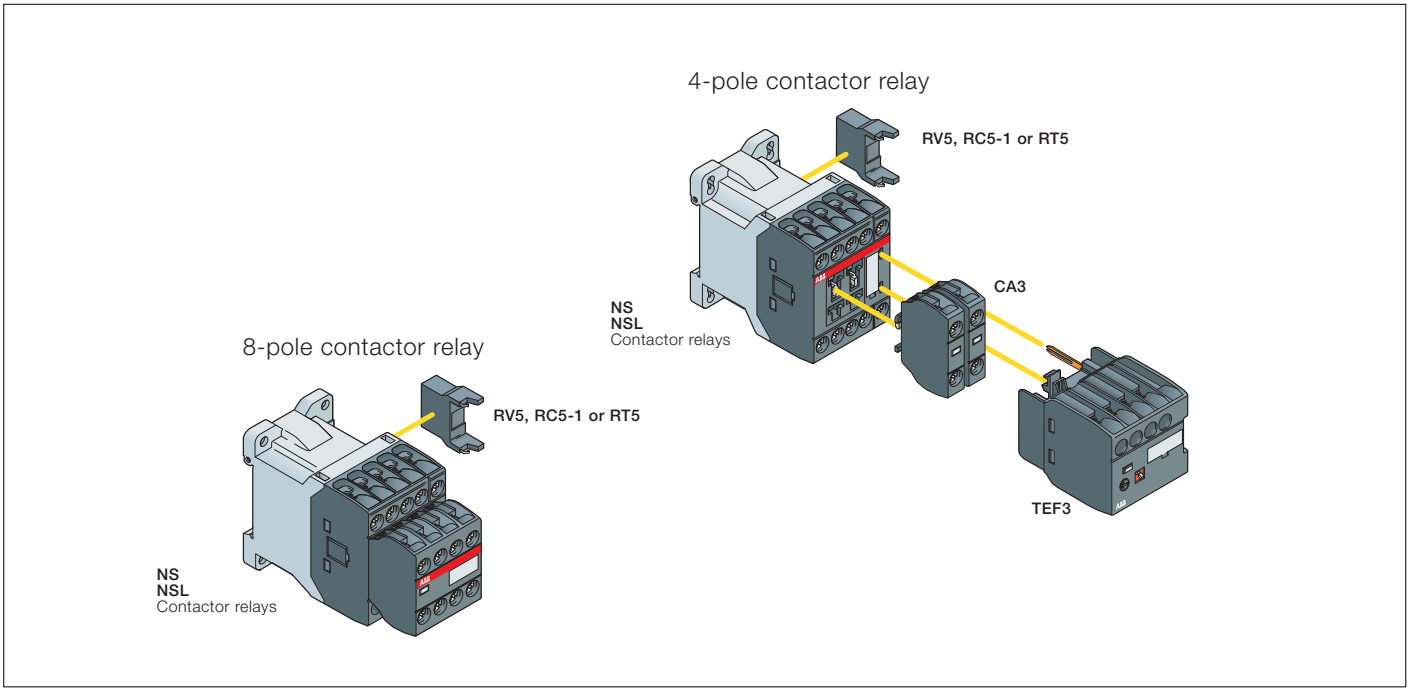
NS and NSL contactor relays
Main accessories

Contactor relays and main accessories (other accessories available)



Main accessory fitting details

Contactor types	Main poles			Front-mounted accessories: Auxiliary contact blocks 1-pole CA3		Electronic timer TEF3		Side-mounted accessories: Surge suppressors		
NS..	2	2	E	2 max.	or	1	+	RV5	or	RC5-1
NS..	3	1	E							
NS..	4	0	E							
NS..	4	4	E	–		–		RV5	or	RC5-1
NS..	5	3	E							
NS..	6	2	E							
NS..	7	1	E							
NS..	8	0	E							
NSL..	2	2	E	2 max.	or	1	+	RV5	or	RT5
NSL..	3	1	E							
NSL..	4	0	E							
NSL..	4	4	E	–		–		RV5	or	RT5
NSL..	5	3	E							
NSL..	6	2	E							
NSL..	7	1	E							
NSL..	8	0	E							

1SBC101298S0201

NS and NSL contactor relays
Main accessories

CA3-10

Front-mounted instantaneous auxiliary contact blocks

For contactor relays	Auxiliary contacts		Type	Order code		Pkg qty	Weight (1 pce) kg
NS, NSL	1	0	CA3-10	1SBN011010T1010		10	0.011
	0	1	CA3-01	1SBN011010T1001		10	0.011

TEF3-ON

Front-mounted electronic timer

For contactors	Rated control circuit voltage - Uc V	Type	Order code		Pkg qty	Weight (1 pce) kg
ON-delay						
NS, NSL	24...240 V AC/DC	TEF3-ON	1SBN021012R1000		1	0.065
OFF-delay						
NS, NSL	24...240 V AC/DC	TEF3-OFF	1SBN021014R1000		1	0.065

RV5

Surge suppressors

For contactor relays	Rated control circuit voltage - Uc V	AC	DC	Type	Order code		Pkg qty	Weight (1 pce) kg
NS, NSL	24...50	●	●	RV5/50	1SBN050010R1000		2	0.015
	50...133	●	●	RV5/133	1SBN050010R1001		2	0.015
	110...250	●	●	RV5/250	1SBN050010R1002		2	0.015
	250...440	●	●	RV5/440	1SBN050010R1003		2	0.015
NS	24...50	●	–	RC5-1/50	1SBN050100R1000		2	0.012
	50...133	●	–	RC5-1/133	1SBN050100R1001		2	0.012
	110...250	●	–	RC5-1/250	1SBN050100R1002		2	0.012
	250...440	●	–	RC5-1/440	1SBN050100R1003		2	0.012
NSL	12...32	–	●	RT5/32	1SBN050020R1000		2	0.015
	25...65	–	●	RT5/65	1SBN050020R1001		2	0.015
	50...90	–	●	RT5/90	1SBN050020R1002		2	0.015
	77...150	–	●	RT5/150	1SBN050020R1003		2	0.015
	150...264	–	●	RT5/264	1SBN050020R1004		2	0.015

1SBC101298S0201

NS and NSL contactor relays
Technical data

Contact utilization characteristics according to IEC

Contactor relay types	**AC operated**	**NS**
	DC operated	**NSL**
Standards		IEC 60947-5-1 and EN 60947-5-1
Rated operational voltage Ue max.		690 V
Rated frequency (without derating)		50 / 60 Hz
Conventional free-air thermal current Ith - θ ≤ 40 °C		10 A
Ie / Rated operational current AC-15		
acc. to IEC 60947-5-1	**24-127 V 50/60 Hz**	6 A
	220-240 V 50/60 Hz	4 A
	400-440 V 50/60 Hz	3 A
	500 V 50/60 Hz	2 A
	690 V 50/60 Hz	2 A
Making capacity AC-15		10 x Ie AC-15 acc. to IEC 60947-5-1
Breaking capacity AC-15		10 x Ie AC-15 acc. to IEC 60947-5-1
Ie / Rated operational current DC-13		
acc. to IEC 60947-5-1	**24 V DC**	6 A / 144 W
	48 V DC	2.8 A / 134 W
	72 V DC	1 A / 72 W
	110 V DC	0.55 A / 60 W
	125 V DC	0.55 A / 69 W
	220 V DC	0.27 A / 60 W
	250 V DC	0.27 A / 68 W
Short-circuit protection device for contactors		
Ue ≤ 500 V AC - gG type fuse		10 A
Rated short-time withstand current Icw	**for 1.0 s**	100 A
	for 0.1 s	140 A
Minimum switching capacity		12 V / 3 mA
with failure rate acc. to IEC 60947-5-4		10^{-7}
Non-overlapping time between N.O. and N.C. contacts		1.5 ms
Power dissipation per pole at 6 A		0.1 W
Max. electrical switching frequency	**AC-15**	1200 cycles/h
	DC-13	900 cycles/h
Mechanically linked contacts		Built-in N.O. or N.C. auxiliary contacts and additional N.O. or N.C. auxiliary contacts (CA3 aux. contact blocks) are mechanically linked contacts.
acc. to annex L of IEC 60947-5-1		

Contact utilization characteristics according to UL / CSA

Contactor relay types	**AC operated**	**NS**
	DC operated	**NSL**
Standards		UL 508, CSA C22.2 N°14
Max. operational voltage		600 V AC, 250 V DC
Pilot duty		A600, Q300
AC thermal rated current		10 A
AC maximum volt-ampere making		7200 VA
AC maximum volt-ampere breaking		720 VA
DC thermal rated current		2.5 A
DC maximum volt-ampere making-breaking		69 VA

4

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NS and NSL contactor relays
Technical data

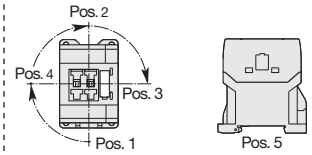
Magnet system characteristics for NS contactor relays

Contactor relay types		**AC operated**	NS
Coil operating limits		**AC supply**	
acc. to IEC 60947-5-1			0.85...1.1 x Uc (at θ ≤ 60 °C); Uc (at θ ≤ 70 °C)
AC control voltage	Rated control circuit voltage Uc	**at 50 Hz**	24...415 V
		at 60 Hz	24...415 V
	Coil consumption	**Average pull-in value 50 Hz**	33 VA
		60 Hz	33 VA
		50/60 Hz	33 VA
		Average holding value 50 Hz	6.5 VA / 1.5 W
		60 Hz	5 VA / 1.2 W
		50/60 Hz	6.5 VA / 1.5 W
Drop-out voltage			Approx. 30...50 % of Uc
Operating time			
Between coil energization and:		**N.O. contact closing**	9...24 ms
		N.C. contact opening	6...18 ms
Between coil de-energization and:		**N.O. contact opening (1)**	5...19 ms
		N.C. contact closing (1)	7...22 ms
			(1) The use of RC5-1 surge suppressor increases opening time by a factor of 2 to 3.

Magnet system characteristics for NSL contactor relays

Contactor relay types		**DC operated**	NSL
Coil operating limits		**DC supply**	
acc. to IEC 60947-5-1			0.85...1.1 x Uc (at θ ≤ 60 °C); Uc (at θ ≤ 70 °C)
DC control voltage	Rated control circuit voltage Uc		12...240 V DC
	Coil consumption	**Average pull-in value**	3 W
		Average holding value	3 W
Drop-out voltage			Approx. 10...40 % of Uc
Coil time constant	Open	**L/R**	12 ms
	Closed	**L/R**	40 ms
Operating time			
Between coil energization and:		**N.O. contact closing**	36...59 ms
		N.C. contact opening	31...53 ms
Between coil de-energization and:		**N.O. contact opening (1)**	13...17 ms
		N.C. contact closing (1)	15...20 ms
			(1) The use of RT5 surge suppressor increases opening time by a factor of 1.1 to 1.2.

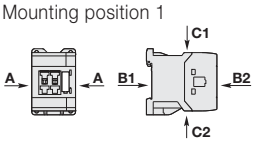
Mounting characteristics and conditions for use

Contactor relay types		**AC operated**	NS
		DC operated	NSL
Mounting positions			
Mounting distances			The contactor relays can be assembled side by side.
Fixing	On rail according to IEC 60715, EN 60715		35 x 7.5 mm or 35 x 15 mm
	By screws (not supplied)		2 x M4 screws placed diagonally

1SBC101502S0201

NS and NSL contactor relays
Technical data

General technical data

Contactor relay types	**AC operated**	NS	
	DC operated	NSL	
Rated insulation voltage Ui			
acc. to IEC 60947-5-1		690 V	
acc. to UL / CSA		600 V	
Rated impulse withstand voltage Uimp.		6 kV	
Ambient air temperature close to contactor relay			
Operation in free air		-40...+70 °C	
Storage		-60...+80 °C	
Climatic withstand		Category B according to IEC 60947-1 Annex Q	
Maximum operating altitude (without derating)		3000 m	
Mechanical durability			
Number of operating cycles		20 millions operating cycles	
Max. switching frequency		3600 cycles/h	
Shock withstand		1/2 sinusoidal shock for 11 ms: no change in contact position, closed or open position	
acc. to IEC 60068-2-27 and EN 60068-2-27	**Shock direction**	**NS contactor relays - AC operated**	**NSL contactor relays - DC operated**
Mounting position 1	**A**	20 g	20 g closed position / 10 g open position
	**B1**	5 g	15 g closed position / 5 g open position
	B2	15 g	10 g
	C1	19 g closed position / 8 g open position	19 g closed position / 8 g open position
	C2	16 g closed position / 13 g open position	14 g closed position / 8 g open position
Vibration withstand acc. to IEC 60068-2-6		5...300 Hz / 3 g closed position / 2 g open position	

Connecting characteristics

Contactor relay types	**AC operated**	NS	
	DC operated	NSL	
Main terminals		Screw terminals with cable clamp	
Connection capacity (min. ... max.)			
Pole and coil terminals			
Rigid solid	**1 x**	0.75...2.5 mm²	
	2 x	0.75...2.5 mm²	
Flexible with non insulated ferrule	**1 x**	0.75...2.5 mm²	
	2 x	0.75...2.5 mm²	
Flexible with insulated ferrule	**1 x**	0.75...2.5 mm²	
	2 x	0.75...1.5 mm²	
Lugs	**L ≤**	7.7 mm	
	I >	3.2 mm	
Connection capacity acc. to UL / CSA	**1 or 2 x**	AWG 18...14	
Stripping length		9 mm	
Tightening torque Recommended		1.00 Nm / 9 lb.in	
Max.		1.20 Nm	
Degree of protection acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529			
All terminals		IP20	
Screw terminals		Delivered in open position, screws of unused terminals must be tightened	
All terminals		M3	
	Screwdriver type	Flat Ø 5.5 / Pozidriv 2	

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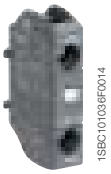
Accessories for AS contactors and NS contactor relays

Auxiliary contact blocks **4**/32
Frontal electronic timers **4**/33
Surge suppressors **4**/34
Mechanical interlock unit and fixing clips **4**/35
Connection accessories for starting solutions **4**/36

Auxiliary contact blocks
Accessories



CA3-10

4

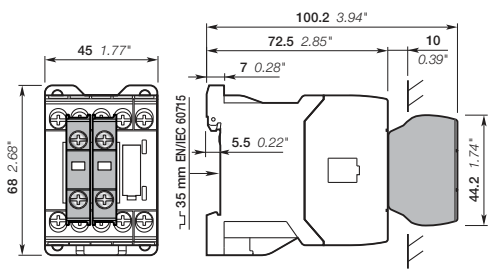
Description

The auxiliary contact blocks are used for the operation of auxiliary circuits and control circuits.
CA3 1-pole auxiliary contact blocks, designed for standard industrial environments, are equipped with:
– N.O. or N.C. contacts.
– Screw-type connecting terminals with cage clamp delivered open.
All 1-pole auxiliary contact blocks are protected against accidental direct contact and bear the corresponding function marking.
A maximum of two 1-pole auxiliary contact blocks can be front-mounted on 1-stack contactors or 1-stack contactor relays.

Ordering details

For contactors	For contactor relays	Contact blocks		Type	Order code		Pkg qty	Weight (1 pce) kg
1-pole auxiliary contact blocks with screw terminals								
AS09 ... AS16	NS, NSL	1	–	CA3-10	1SBN011010T1010		10	0.011
ASL09 ... ASL16		–	1	CA3-01	1SBN011010T1001		10	0.011

Main dimensions mm, *inches*



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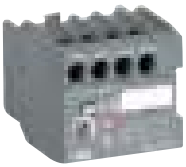
Electronic timers

TEF3-ON



TEF3-OFF

Description

TEF3 frontal electronic timers are used for realizing timing function independently of the control system and are available in ON-delay and OFF-delay versions.

Compact solution in cabinet compared to separate timers

TEF3 electronic timers are front-mounted and locked on AS/ASL contactors or NS/NSL contactor relays. A mechanical indicator allows to show the state of the contactor.

Safe and cost-reduced wiring

TEF3 electronic timers are supplied by a direct plug-in parallel connection to the coil terminals A1 - A2 of the contactor or contactor relay. A varistor is integrated on the timer to offer a built-in protection against surges in the contactor coil.

Available for a wide control voltage range 24...240 V AC/DC

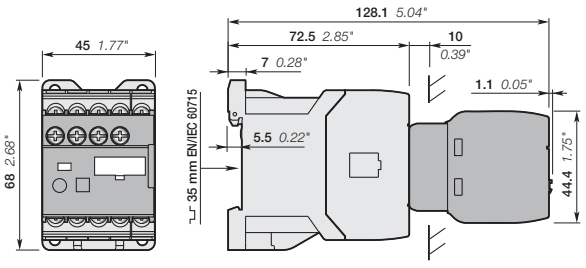
TEF3-ON or TEF3-OFF allow time-delayed functions up to 100 s in 3 distinct time ranges, independently of the control system. The time delay ranges are selected by a switch and the time delay can be adjusted by means of a rotary switch. The timing function is activated by closing the device on which the timer is mounted. The OFF-delay version operates without additional control supply.

4

Ordering details

For contactors, contactor relays	Time delay range selected by switch	Delay type	Rated control circuit voltage Uc V 50/60 Hz or DC	Auxiliary contacts		Type	Order code		Weight Pkg (1 pce) kg
AS09 ... AS16 ASL09 ... ASL16 NS, NSL	0.1...1 s 1...10 s 10...100 s	ON-delay	24...240	1	1	TEF3-ON	1SBN021012R1000		0.065
		OFF-delay	24...240	1	1	TEF3-OFF	1SBN021014R1000		0.065

Main dimensions mm, *inches*



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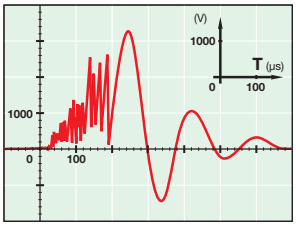
Surge suppressors for contactor coils



1SBC101042F0014

RV5

1SBC101042F0014

RC5-1

1SBC101042F0014

RT5

Description

The operation of inductive circuits causes overvoltages, in particular on opening the contactor coil.

The electromagnetic energy stored in the coil during contactor closing is restored on opening in the form of surges, the slope and amplitude of which may rise to several kilovolts. A number of drawbacks are observed ranging from interference on the electronic devices to the breakdown of insulators and even the destruction of certain sensitive components.

The graph opposite reproduces the oscillogram showing voltage discharges at the terminals of a 42 V / 50 Hz coil without peak clipping. The coil was switched by 8 series-connected poles of a contactor relay.

Following a burst of discharges with a very steep slope, a damped oscillation emerges with a peak value of 3500 V.

Overvoltage Factor

The overvoltage factor k is defined as the ratio of the maximum overvoltage peak value Ûs to the peak value Ûc of the coil rated control voltage Uc:

$k = \frac{\hat{U}s\ max.}{\hat{U}c}$ in DC $k = \frac{\hat{U}s\ max.}{Uc}$ in AC $k = \frac{\hat{U}s\ max.}{Uc\ \sqrt{2}}$

For example the following is obtained for the above graph: $k = \frac{3500}{42\ \sqrt{2}} \approx 60$

To reduce the harmful effects of these overvoltages, ABB has developed a range of surge suppressors designed to reduce the k factor defined above and to limit or even completely eliminate the high pre-damping voltage frequencies.

Each case is different, but the technical data tolerances and generous sizing of parts have enabled us to reduce the number of variants.

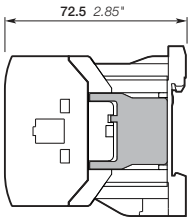
We have chosen the following solutions: transil diodes, varistors and RC blocks.

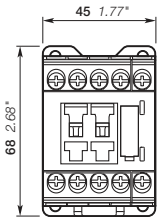
Note: A varistor is a resistor whose value decreases to a very large extent when a certain voltage is applied at its terminals.

Ordering details

For contactors	For contactor relays	Rated control circuit voltage - Uc			Type	Order code		Pkg qty	Weight (1 pce)
		V	AC	DC					kg
AS, ASL	NS, NSL	24...50	●	●	RV5/50	1SBN050010R1000		2	0.015
		50...133	●	●	RV5/133	1SBN050010R1001		2	0.015
		110...250	●	●	RV5/250	1SBN050010R1002		2	0.015
		250...440	●	●	RV5/440	1SBN050010R1003		2	0.015
AS	NS	24...50	●	–	RC5-1/50	1SBN050100R1000		2	0.012
		50...133	●	–	RC5-1/133	1SBN050100R1001		2	0.012
		110...250	●	–	RC5-1/250	1SBN050100R1002		2	0.012
		250...440	●	–	RC5-1/440	1SBN050100R1003		2	0.012
ASL	NSL	12...32	–	●	RT5/32	1SBN050020R1000		2	0.015
		25...65	–	●	RT5/65	1SBN050020R1001		2	0.015
		50...90	–	●	RT5/90	1SBN050020R1002		2	0.015
		77...150	–	●	RT5/150	1SBN050020R1003		2	0.015
		150...264	–	●	RT5/264	1SBN050020R1004		2	0.015

Main dimensions mm, *inches*





Easy connection to the coil terminals
(parallel mounting)
Clip-on for both fixing and connection.

No additional space
Clipped onto the right side part of the contactor base without changing contactor overall dimensions and keeping a free access to coil terminals.

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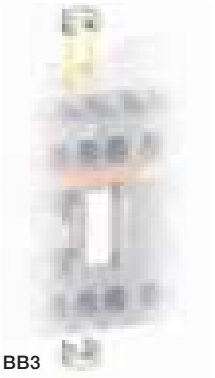
Mechanical interlock unit and fixing clips

VM3



BB3

Mechanical interlock unit

When mounted between two contactors without additional width, the VM3 mechanical interlock unit prevents one of the contactors from closing as long as the other contactor is closed.

The mechanical interlock unit includes 2 fixing clips.

Ordering details

For contactors		Type	Order code		Pkg qty	Weight (1 pce)
Left	Right					kg
AS	AS	VM3	1SBN031005T1000		10	0.002
ASL	ASL					

Note : VM3 mechanical durability, 5 millions of operating cycles on both reversing contactors.

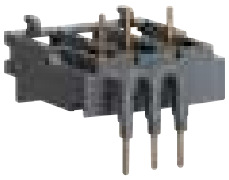
Fixing clips

BB3 is a set of 50 fixing clips.

Ordering details

For contactors	Type	Order code		Pkg qty	Weight (1 pce)
					kg
AS, ASL	BB3	1SBN111020R1000		1	0.009

Connection accessories for starting solutions



BEA16-3

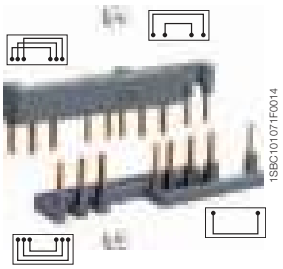
Connecting links

The BEA16-3 insulated 3-pole connecting links are used to connect an AC or DC operated contactors with manual motor starters.

The connecting links ensure the electrical and mechanical connection between the contactor and the manual motor starter.

Ordering details

For contactors	Manual motor starter	Type	Order code		Pkg qty	Weight (1 pce) kg
AS09 ... AS16 ASL09 ... ASL16	MS116-0.16 ... MS116-16 MS132-0.16 ... MS132-16	BEA16-3	1SBN081006T1000		10	0.019



BER16C-3

Connection sets for reversing contactors

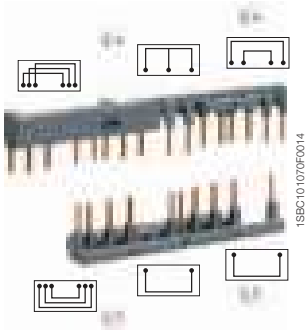
The BER16C-3 connection sets are used for the connections between the main poles of two 3-pole contactors mounted side by side as reversing contactors, including electrical interlocking between built-in N.C. auxiliary contact and coil terminals.

The connection sets are made up of:

– 1 upstream and 1 downstream connections: insulated, solid copper bars,
– 2 connections to realize electrical interlocking between contactors equipped with built-in N.C. auxiliary contacts,
– 2 fixing clips.

Ordering details

For contactors	Mechanical interlock unit	Type	Order code		Pkg qty	Weight (1 pce) kg
2 x AS09 ... AS16 2 x ASL09 ... ASL16	with or without VM3	BER16C-3	1SBN081012R1000		1	0.035



BEY16C-3

Connection sets for star-delta starting

BEY16C-3 connection sets are designed for star-delta starters whose contactors are assembled according to line delta star mounting.

The connection sets are made up of:

– Line contactor / delta contactor: upstream phase-to-phase connection,
– Delta contactor / star contactor: downstream connection in parallel,
– Star contactor: star point upstream,
– An electrical interlocking between delta and star contactors equipped with built-in N.C. auxiliary contacts,
– 4 fixing clips.

Ordering details

For contactors			Mech. interlock unit between star & delta contactors	Type	Order code		Pkg qty	Weight (1 pce) kg
Line	Delta	Star						
AS09 AS12	AS09 AS12	AS09 AS09	with or without VM3	BEY16C-3	1SBN081018R2000		1	0.041

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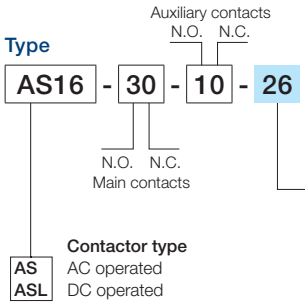
Voltage code table

The below tables indicate the available coil voltages and corresponding digits for order codes. When placing an order, please give either type or order code. Select a standard contactor from ordering detail pages. Change the **coil voltage code** in the type or in the order code according to the table below. Example: for contactor AS09-30-10 and coil 42 V 50/60 Hz, type is AS09-30-10-**21** and order code is 1SBL101001R**21**10.

3-pole contactors

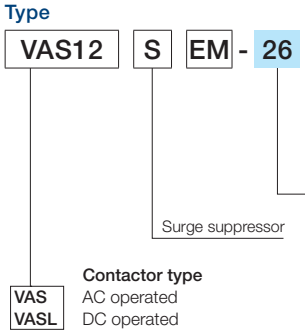


Order code

1SBL121001R	26	10

	AC coil code 50 Hz	60 Hz	DC coil code	
20	24 V	24 V	80	12 V
21	42 V	42 V	81	24 V
22	48 V	48 V	83	48 V
23	110 V	110 V	84	60 V
24	115 V	115 V	86	110 V
16	–	120 V	87	125 V
25	220 V	220 V	88	220 V
26	**230 V**	**230 V**	89	240 V
27	240 V	240 V		
17	–	277 V		
13	380 V	–		
28	400 V	400 V		
29	415 V	415 V		

3-pole reversing contactors



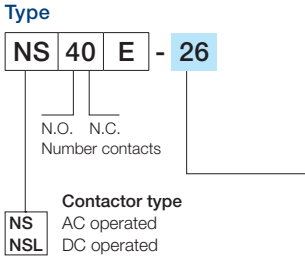
Order code

1SBK113800M	26	00

	AC coil code 50 Hz	60 Hz	DC coil code	
20	24 V	24 V	80	12 V (1)
21	42 V	42 V	81	24 V
22	48 V	48 V	83	48 V
23	110 V	110 V	84	60 V
24	115 V	115 V	86	110 V
16	–	120 V	87	125 V
25	220 V	220 V	88	220 V
26	**230 V**	**230 V**	89	240 V
27	240 V	240 V		
17	–	277 V		
13	380 V	–		
28	400 V	400 V		
29	415 V	415 V		

(1) Not for VASL..SEM

Contactor relays



Order code

1SBH101001R	26	40

	AC coil code 50 Hz	60 Hz	DC coil code	
20	24 V	24 V	80	12 V
21	42 V	42 V	81	24 V
22	48 V	48 V	83	48 V
23	110 V	110 V	84	60 V
24	115 V	115 V	86	110 V
16	–	120 V	87	125 V
25	220 V	220 V	88	220 V
26	**230 V**	**230 V**	89	240 V
27	240 V	240 V		
17	–	277 V		
13	380 V	–		
28	400 V	400 V		
29	415 V	415 V		

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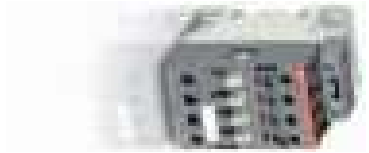

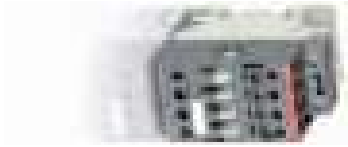

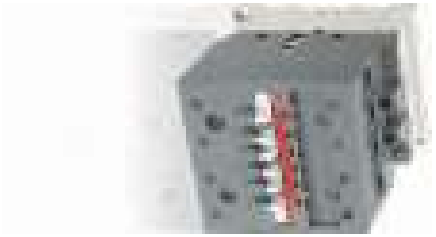

A, AF, EK contactors and NF contactor relays

AF, A 3-pole contactors

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AF, A and EK 4-pole contactors

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NF 4-pole contactor relays

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Accessories for A, AF, EK contactors and NF contactor relays

Accessories for AF09 ... AF38 contactors and NF contactor relays **5**/115
Accessories for A40 ... AF2050 contactors **5**/121
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Voltage code table **5/157**

1SBC101639S0201

1SBC101608S0201

AF, A 3-pole contactors

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Ordering details

4 to 18.5 kW / 5 to 20 hp

AF09 ... AF38	AC / DC operated	5/6
AF09Z ... AF38Z	AC / DC operated - low consumption	5/7
Main accessories		5/8

18.5 to 37 kW / 30 to 60 hp

A40	AC operated	5/10
A50 ... A75	AC operated	5/11
AL40	DC operated	5/12
AE50 ... AE75	DC operated	5/13
AF50 ... AF75	AC / DC operated	5/14
Main accessories		5/16

45 to 55 kW / 60 to 75 hp

A95 ... A110	AC operated	5/18
AF95 ... AF110	AC / DC operated	5/19
Main accessories		5/20

75 to 560 kW / 100 to 900 hp

A145 ... A300	AC operated	5/22
AF145 ... AF300	AC / DC operated	5/23
AF400 ... AF750	AC / DC operated	5/24
AF1250 ... AF2050	AC / DC operated	5/25
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Accessories

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Accessories for A40 ... AF2050 contactors	5/121

Voltage code table 5/157

1SBC101608S0201

3-pole contactors, for all industrial applications and motor starting

IEC	**AC-3 Rated operational power**	θ ≤ 55 °C*, 400 V	**kW**	**4**	**5.5**	**7.5**	**11**	**15**	**18.5**	**18.5**	**22**	**30**	**37**
UL/CSA	**3-phase motor rating**	480 V	**hp**	**5**	**7.5**	**10**	**15**	**20**	**20**	**30**	**40**	**60**	**60**
AC Control supply			Type	**AF09**	**AF12**	**AF16**	**AF26**	**AF30**	**AF38**	**A40**	**A50**	**A63**	**A75**
DC Control supply			Type	**AF09**	**AF12**	**AF16**	**AF26**	**AF30**	**AF38**	**AL40**	**AE50**	**AE63**	**AE75**
AC / DC Control supply			Type	**AF09**	**AF12**	**AF16**	**AF26**	**AF30**	**AF38**	**—**	**AF50**	**AF63**	**AF75**
IEC	**AC-3 Rated operational current**	θ ≤ 55 °C*, 400 V	**A**	**9**	**12**	**18**	**26**	**32**	**38**	**37**	**50**	**65**	**75**
	AC-1 Rated operational current	θ ≤ 40 °C, 690 V	**A**	**25**	**28**	**30**	**45**	**50**	**50**	**60**	**100**	**115**	**125**
UL/CSA	**General use rating**	600 V	**A**	**25**	**28**	**30**	**45**	**50**	**50**	**60**	**80**	**90**	**105**
NEMA	**NEMA Size**			**00**	**0**	**—**	**1**	**—**	**—**	**—**	**2**	**—**	**3**

* θ ≤ 60 °C for AF09 ... AF38 contactors

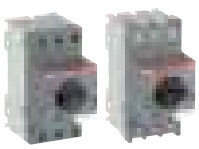
Main accessories

Auxiliary contact blocks	Front mounting	**CA4-10** (1 x N.O.), **CA4-01** (1 x N.C.)		**CA5-10** (1 x N.O.), **CA5-01** (1 x N.C.)		
	Side mounting	**CAL4-11** (1 x N.O. + 1 x N.C.)		**CAL5-11** (1 x N.O. + 1 x N.C.)		
Timers	Pneumatic (Front mounting)			**TP40DA, TP180DA** Direct timing **TP40IA, TP180IA** Inverse timing		
Interlocking units	Mechanical	**VM4**		**VM5-1**		
	Mechanical / Electrical	**VEM4**		**VE5-1**	**VE5-2**	
Connection sets	For reversing contactors	**BER16-4**	**BER38-4**	**BER40V**	**BEM75-30**	
Surge suppressors	Varistor (AC / DC)			**RV5** (24...440 V)		
AF contactors have built-in surge protection	RC type (AC)			**RC5-1** (24...440 V)	**RC5-2** (24...440 V)	
	Transil diode (DC)			**RT5** (12...264 V)		

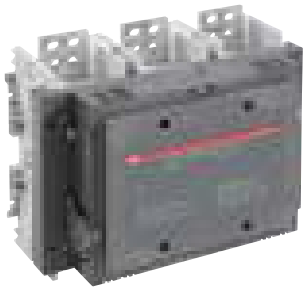
Overload relays

Thermal relays	Class 10 (10A or 20 for TA42DU to TA80DU)	**TF42** (0.10...38 A)		**TA42DU** (18...42 A)	**TA75DU** (18...80 A)	
Electronic relays	Class 10E, 20E, 30E	**EF19** (0.10...18.9 A)	**EF19** (0.10...18.9 A), **EF45** (9...45 A)	**E45DU** (9...45 A)	**E80DU** (27...80 A)	
Accessories for thermal overload relays	Remote tripping coil					
	Remote reset coil					
	Wall/separate mounting kit	**DB42** (TF42 only)		**DB80, DB45E, DB80E**		

Manual motor starters



	Thermal / magnetic protection	Class 10	**MS116** for class 10A (0.16...32 A) Ics up to 50 kA		**MS450** (40...50 A) Ics up to 50 kA		
			MS132 (0.10...32 A) Ics up to 100 kA			**MS495** (28...100 A) Ics up to 50 kA	
					MS497 (11...100 A) Ics up to 100 kA		
		Class 20			**MS451** (11...50 A) Ics up to 50 kA		
						MS496 (28...100 A) Ics up to 100 kA	
	Magnetic only types		**MO132** (0.10...32 A)		**MO450** (16...50 A) Ics up to 50 kA		**MO495**
					MO496 (16...100 A) Ics up to 100 kA		
Accessories	For contactor mounting		**BEA16-4**	**BEA38-4**	**BEA40/450**	**BEA50/450,**	
	Auxiliary trip units, auxiliary contacts, busbars		**HKF1, HK1, UA1, AA1, PS1, S1, SK1** **CK1** (MS132, MO132 only)		**HK4, HKS4, UA4, AA4, PS4, S4, SK4**		



	45	55	75	90	110	140	160	200	250	315	400	–	475	560	–
	60	75	100	125	150	200	250	350	400	500	600	–	800	900	–
	A95	A110	A145	A185	A210	A260	A300	AF400	AF460	AF580	AF750	AF1250	AF1350	AF1650	AF2050
	AF95	AF110	AF145	AF185	AF210	AF260	AF300	AF400	AF460	AF580	AF750	AF1250	AF1350	AF1650	AF2050
	AF95	AF110	AF145	AF185	AF210	AF260	AF300	AF400	AF460	AF580	AF750	AF1250	AF1350	AF1650	AF2050
	96	110	145	185	210	260	305	400	460	580	750	–	860	1050	–
	145	160	250	275	350	400	500	600	700	800	1050	1260	1350	1650	2050
	125	140	230	250	300	350	400	550	650	750	900	1210	1350	1650	2100
	–	–	4	–	–	5	–	–	6	–	7	–	–	8	–

	CAL18-11 (1 x N.O. + 1 x N.C.)					
		VM300H / VM300V		**VM750H / VM750V**		**VM1650H**
	BEM110-30	**BEM185-30**	**BEM300-30**	**BEM460-30**	**BEM750-30**	
		RC5-3 (250...440V)				

	TA80DU (29...80 A) **TA110DU** (65...110 A)	**TA200DU** (66...200 A)	**TA450DU/SU** (130...310 A) class 30 for SU			
	E140DU (50...140 A)	**E200D-U** (60...200 A)	**E320DU** (100...320 A)	**E500DU** (150...500 A)	**E800DU** (250...800 A)	**E1250DU** (375...1250 A)
			DS25-A			
			DR25-A			
	DB80, DB200, D140E	**DB200**	**DT450/A**			

Circuit breakers

Tmax Circuit breaker and accessories

(40...100 A) Ics up to 50 kA

BEA75/495

5

1SBC101555S0201

AF09 ... AF38 3-pole contactors
4 to 18.5 kW
AC / DC operated

AF09-30-10

AF26-30-00

5

Description

AF09 ... AF38 contactors are mainly used for controlling 3-phase motors and power circuits up to 690 V AC and 220 V DC. These contactors are of the block type design with 3 main poles.

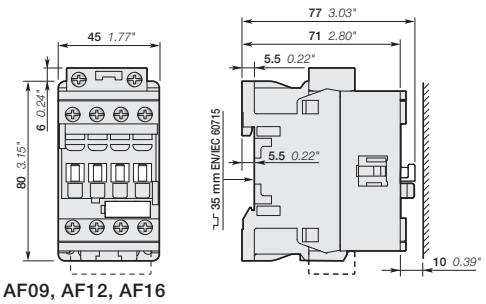
– control circuit: AC or DC operated with electronic coil interface accepting a wide control voltage range (e.g. 100...250 V AC and DC), only 4 coils to cover control voltages between 24...500 V 50/60 Hz and 20...500 V DC
  - can manage large control voltage variations
  - reduced panel energy consumption
  - very distinct closing and opening.
– built-in surge suppression
– add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

Ordering details

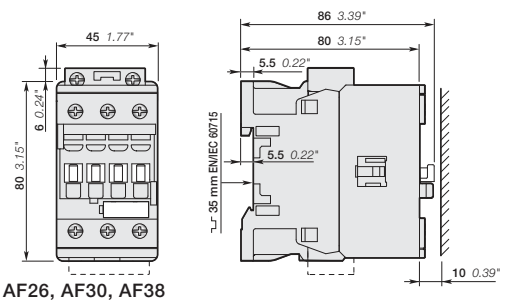
IEC		UL/CSA		Rated control circuit voltage Uc min. ... Uc max.		Auxiliary contacts fitted		Type	Order code		Weight
Rated operational power 400 V AC-3	current θ ≤ 40 °C AC-1	3-phase motor rating 480 V	General use rating 600 V AC								Pkg (1 pce)
kW	A	hp	A	V 50/60 Hz	V DC						kg
4	25	5	25	24...60	20...60 (1)	1	0	AF09-30-10-11	1SBL137001R1110		0.270
						0	1	AF09-30-01-11	1SBL137001R1101		0.270
				48...130	48...130	1	0	AF09-30-10-12	1SBL137001R1210		0.270
						0	1	AF09-30-01-12	1SBL137001R1201		0.270
				100...250	100...250	1	0	AF09-30-10-13	1SBL137001R1310		0.270
						0	1	AF09-30-01-13	1SBL137001R1301		0.270
				250...500	250...500	1	0	AF09-30-10-14	1SBL137001R1410		0.310
						0	1	AF09-30-01-14	1SBL137001R1401		0.310
5.5	28	7.5	28	24...60	20...60 (1)	1	0	AF12-30-10-11	1SBL157001R1110		0.270
						0	1	AF12-30-01-11	1SBL157001R1101		0.270
				48...130	48...130	1	0	AF12-30-10-12	1SBL157001R1210		0.270
						0	1	AF12-30-01-12	1SBL157001R1201		0.270
				100...250	100...250	1	0	AF12-30-10-13	1SBL157001R1310		0.270
						0	1	AF12-30-01-13	1SBL157001R1301		0.270
				250...500	250...500	1	0	AF12-30-10-14	1SBL157001R1410		0.310
						0	1	AF12-30-01-14	1SBL157001R1401		0.310
7.5	30	10	30	24...60	20...60 (1)	1	0	AF16-30-10-11	1SBL177001R1110		0.270
						0	1	AF16-30-01-11	1SBL177001R1101		0.270
				48...130	48...130	1	0	AF16-30-10-12	1SBL177001R1210		0.270
						0	1	AF16-30-01-12	1SBL177001R1201		0.270
				100...250	100...250	1	0	AF16-30-10-13	1SBL177001R1310		0.270
						0	1	AF16-30-01-13	1SBL177001R1301		0.270
				250...500	250...500	1	0	AF16-30-10-14	1SBL177001R1410		0.310
						0	1	AF16-30-01-14	1SBL177001R1401		0.310
11	45	15	45	24...60	20...60 (1)	0	0	AF26-30-00-11	1SBL237001R1100		0.310
				48...130	48...130	0	0	AF26-30-00-12	1SBL237001R1200		0.310
				100...250	100...250	0	0	AF26-30-00-13	1SBL237001R1300		0.310
				250...500	250...500	0	0	AF26-30-00-14	1SBL237001R1400		0.350
15	50	20	50	24...60	20...60 (1)	0	0	AF30-30-00-11	1SBL277001R1100		0.310
				48...130	48...130	0	0	AF30-30-00-12	1SBL277001R1200		0.310
				100...250	100...250	0	0	AF30-30-00-13	1SBL277001R1300		0.310
				250...500	250...500	0	0	AF30-30-00-14	1SBL277001R1400		0.350
18.5	50	20	50	24...60	20...60 (1)	0	0	AF38-30-00-11	1SBL297001R1100		0.310
				48...130	48...130	0	0	AF38-30-00-12	1SBL297001R1200		0.310
				100...250	100...250	0	0	AF38-30-00-13	1SBL297001R1300		0.310
				250...500	250...500	0	0	AF38-30-00-14	1SBL297001R1400		0.350

(1) AF..-30-..-11 not suitable for direct control by PLC-output.

Main dimensions mm, *inches*



AF09, AF12, AF16



AF26, AF30, AF38

1SBC101371S0201

AF09Z ... AF38Z 3-pole contactors
4 to 18.5 kW
AC / DC operated - low consumption

AF09Z-30-10

AF26Z-30-00

Description

AF09Z ... AF38Z contactors are mainly used for controlling 3-phase motors and power circuits up to 690 V AC and 220 V DC. These contactors are of the block type design with 3 main poles.

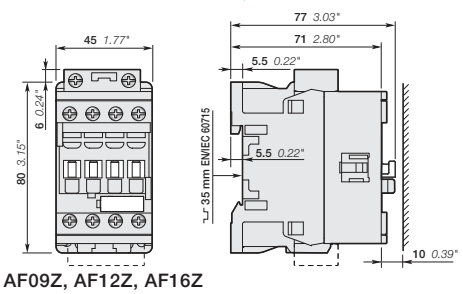
– control circuit: AC or DC operated with electronic coil interface accepting a wide control voltage range (e.g. 100...250 V AC and DC), only 4 coils to cover control voltages between 24...250 V 50/60 Hz and 12...250 V DC
  - can manage large control voltage variations
  - allow direct control by PLC-output ≥ 24 V DC 500 mA
  - reduced panel energy consumption
  - very distinct closing and opening
  - can withstand short voltage dips and voltage sags (SEMI F47-0706 conditions of use on request).
– built-in surge suppression
– add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

Ordering details

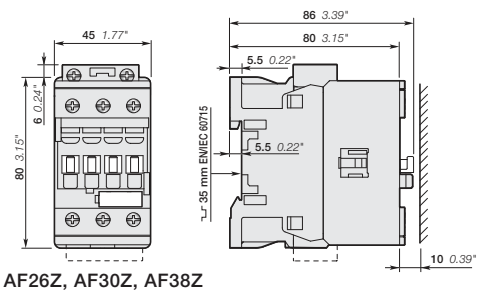
IEC		UL/CSA		Rated control circuit voltage Uc min. ... Uc max.		Auxiliary contacts fitted		Type	Order code		Weight
Rated operational power 400 V AC-3	current θ ≤ 40 °C AC-1	3-phase motor rating 480 V	General use rating 600 V AC								Pkg (1 pce)
kW	A	hp	A	V 50/60 Hz	V DC						kg
4	25	5	25	-	12...20	1	0	AF09Z-30-10-20	1SBL136001R2010		0.310
						0	1	AF09Z-30-01-20	1SBL136001R2001		0.310
				24...60	20...60	1	0	AF09Z-30-10-21	1SBL136001R2110		0.310
						0	1	AF09Z-30-01-21	1SBL136001R2101		0.310
				48...130	48...130	1	0	AF09Z-30-10-22	1SBL136001R2210		0.310
						0	1	AF09Z-30-01-22	1SBL136001R2201		0.310
				100...250	100...250	1	0	AF09Z-30-10-23	1SBL136001R2310		0.310
						0	1	AF09Z-30-01-23	1SBL136001R2301		0.310
5.5	28	7.5	28	-	12...20	1	0	AF12Z-30-10-20	1SBL156001R2010		0.310
						0	1	AF12Z-30-01-20	1SBL156001R2001		0.310
				24...60	20...60	1	0	AF12Z-30-10-21	1SBL156001R2110		0.310
						0	1	AF12Z-30-01-21	1SBL156001R2101		0.310
				48...130	48...130	1	0	AF12Z-30-10-22	1SBL156001R2210		0.310
						0	1	AF12Z-30-01-22	1SBL156001R2201		0.310
				100...250	100...250	1	0	AF12Z-30-10-23	1SBL156001R2310		0.310
						0	1	AF12Z-30-01-23	1SBL156001R2301		0.310
7.5	30	10	30	-	12...20	1	0	AF16Z-30-10-20	1SBL176001R2010		0.310
						0	1	AF16Z-30-01-20	1SBL176001R2001		0.310
				24...60	20...60	1	0	AF16Z-30-10-21	1SBL176001R2110		0.310
						0	1	AF16Z-30-01-21	1SBL176001R2101		0.310
				48...130	48...130	1	0	AF16Z-30-10-22	1SBL176001R2210		0.310
						0	1	AF16Z-30-01-22	1SBL176001R2201		0.310
				100...250	100...250	1	0	AF16Z-30-10-23	1SBL176001R2310		0.310
						0	1	AF16Z-30-01-23	1SBL176001R2301		0.310
11	45	15	45	-	12...20	0	0	AF26Z-30-00-20	1SBL236001R2000		0.350
				24...60	20...60	0	0	AF26Z-30-00-21	1SBL236001R2100		0.350
				48...130	48...130	0	0	AF26Z-30-00-22	1SBL236001R2200		0.350
				100...250	100...250	0	0	AF26Z-30-00-23	1SBL236001R2300		0.350
15	50	20	50	-	12...20	0	0	AF30Z-30-00-20	1SBL276001R2000		0.350
				24...60	20...60	0	0	AF30Z-30-00-21	1SBL276001R2100		0.350
				48...130	48...130	0	0	AF30Z-30-00-22	1SBL276001R2200		0.350
				100...250	100...250	0	0	AF30Z-30-00-23	1SBL276001R2300		0.350
18.5	50	20	50	-	12...20	0	0	AF38Z-30-00-20	1SBL296001R2000		0.350
				24...60	20...60	0	0	AF38Z-30-00-21	1SBL296001R2100		0.350
				48...130	48...130	0	0	AF38Z-30-00-22	1SBL296001R2200		0.350
				100...250	100...250	0	0	AF38Z-30-00-23	1SBL296001R2300		0.350

Note: Only AF..Z contactors with DC control voltage 12...20 V DC need to respect the connection polarities indicated close to the coil terminals: A1+ for the positive pole and A2- for the negative pole.

Main dimensions mm, *inches*



AF09Z, AF12Z, AF16Z

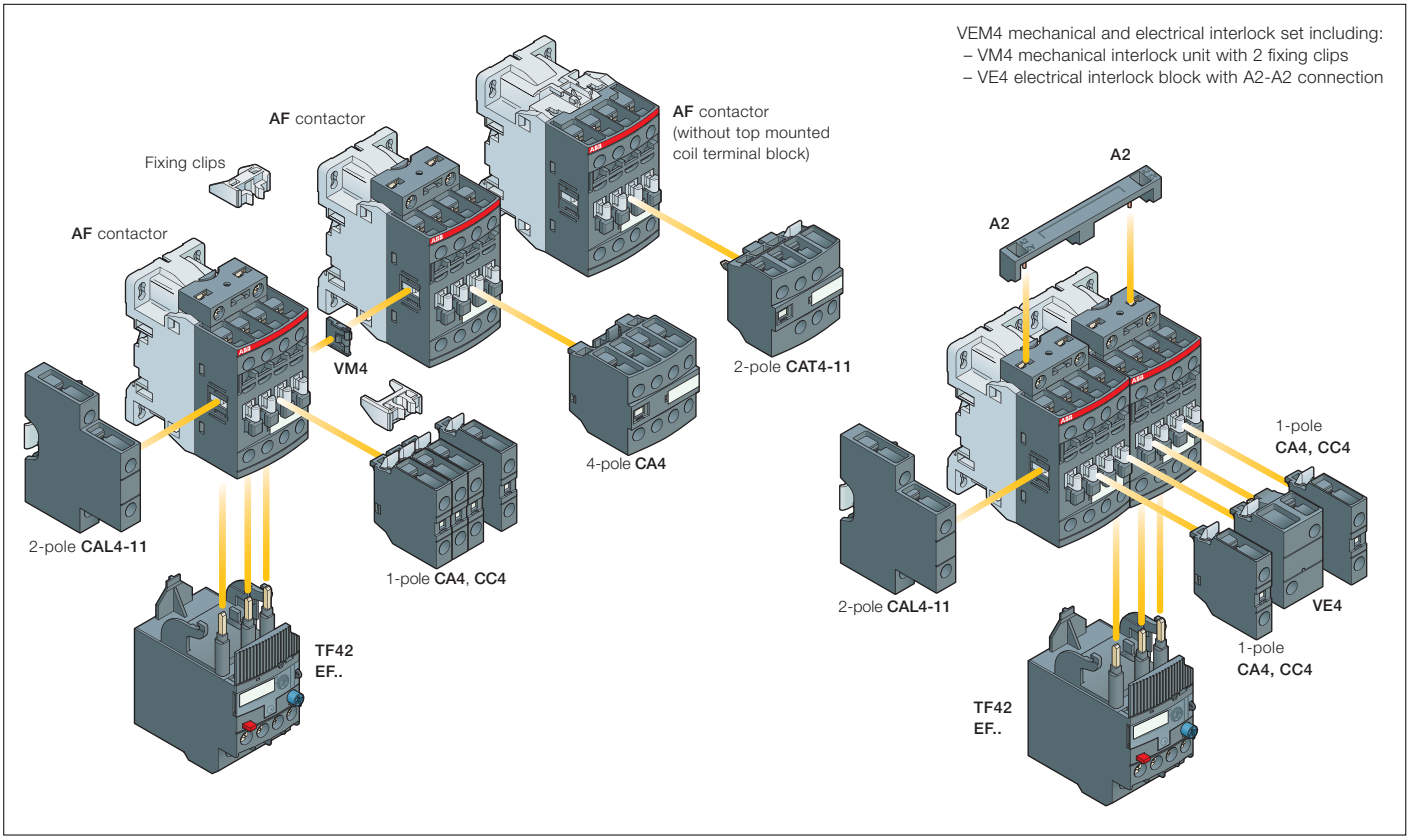


AF26Z, AF30Z, AF38Z

1SBC101372S0201

AF09 ... AF38 3-pole contactors
Main accessories

Contactor and main accessories (other accessories available)



Main accessory fitting details

Many configurations of accessories are possible depending on whether these are front-mounted or side-mounted.

Contactor types	Main poles		Built-in auxiliary contacts		Front-mounted accessories: Auxiliary contact blocks									Electrical and mechanical interlock set (between 2 contactors)		Side-mounted accessories: Auxiliary contact blocks		
					1-pole CA4 / 1-pole CC4		2-pole CAT4-11		4-pole CA4					VEM4		2-pole CAL4-11 Left side		Right side
					Max. N.C. built-in and add-on N.C. auxiliary contacts: 4 N.C. max. on positions 1, 2, 3, 4 and 3 N.C. max. on positions 1 ±30°, 5													
AF09 ... AF16	3	0	0	1	4 max.	or	1	or	1		–	+	1		–			
					2 max.		–		–		–	+	1	+	1			
					3 max.		–		–	+	1	+	1	or	1			
AF09 ... AF16	3	0	1	0	4 max.	or	1	or	1		–	+	1		–			
AF26 ... AF38	3	0	0	0	2 max.	or	1		–		–	+	1	+	1			
					3 max.		–		–	+	1	+	1	or	1			

Overload relays fitting details (1)

Contactor types	Thermal overload relays	Electronic overload relays
AF09 ... AF38	TF42 (0.10...38 A)	EF19 (0.10...18.9 A)
AF26 ... AF38	–	EF45 (9...38 A)

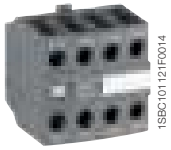
The addition of an overload relay on the contactor does not prevent fitting of many other accessories as shown above.
(1) Direct mounting - No kit required.

1SBC101384S0201

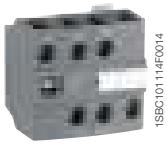
AF09 ... AF38 3-pole contactors
Main accessories

CA4-10

CAL4-11

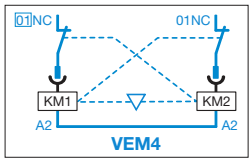


CA4-22M

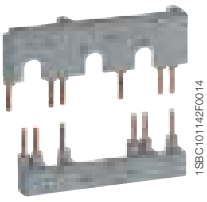


CAT4-11E

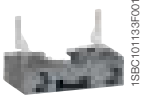
VEM4



BEA16-4



BER16-4



LDC4

BX4

BX4-CA

Ordering details (1)

For contacts	Auxiliary contacts		Type	Order code		Pkg qty	Weight (1 pce) kg
Front-mounted instantaneous auxiliary contact blocks							
AF09 ... AF38	1 0	– –	CA4-10	1SBN010110R1010		1	0.014
	1 0	– –	CA4-10-T	1SBN010110T1010		10	0.014
	0 1	– –	CA4-01	1SBN010110R1001		1	0.014
	0 1	– –	CA4-01-T	1SBN010110T1001		10	0.014
AF09 ... AF16..-30-10	2 2	– –	CA4-22M	1SBN010140R1122		1	0.055
	3 1	– –	CA4-31M	1SBN010140R1131		1	0.055
	1 3	– –	CA4-13M	1SBN010140R1113		1	0.055
	0 4	– –	CA4-04M	1SBN010140R1104		1	0.055
AF26 ... AF38..-30-00	2 2	– –	CA4-22E	1SBN010140R1022		1	0.055
	3 1	– –	CA4-31E	1SBN010140R1031		1	0.055
	4 0	– –	CA4-40E	1SBN010140R1040		1	0.055
	0 4	– –	CA4-04E	1SBN010140R1004		1	0.055
AF09 ... AF16..-30-01	2 2	– –	CA4-22U	1SBN010140R1322		1	0.055
	3 1	– –	CA4-31U	1SBN010140R1331		1	0.055
	4 0	– –	CA4-40U	1SBN010140R1340		1	0.055
Front-mounted auxiliary contact blocks with N.O. leading contact and N.C. lagging contact							
AF09 ... AF38	– –	1 0	CC4-10	1SBN010111R1010		1	0.014
	– –	0 1	CC4-01	1SBN010111R1001		1	0.014
Side-mounted instantaneous auxiliary contact blocks							
AF09 ... AF38	1 1	– –	CAL4-11	1SBN010120R1011		1	0.040
	1 1	– –	CAL4-11-T	1SBN010120T1011		10	0.040
Front-mounted instantaneous auxiliary contact and A1/A2 coil terminal blocks							
AF09 ... AF16..-30-10	1 1	– –	CAT4-11M	1SBN010151R1111		1	0.040
AF26 ... AF38..-30-00	1 1	– –	CAT4-11E	1SBN010151R1011		1	0.040
AF09 ... AF16..-30-01	1 1	– –	CAT4-11U	1SBN010151R1311		1	0.040
Note: CAT4 not fittable on AF..Z contactors with DC control voltage 12...20 V DC.							
Mechanical interlock unit							
AF09 ... AF38			VM4	1SBN030105T1000		10	0.005
Note: VM4 includes 2 fixing clips (BB4) to maintain together both contactors.							
Mechanical and electrical interlock set							
AF09 ... AF16 AF26 ... AF38	1 1	– –	VEM4	1SBN030111R1000		1	0.035
Note: - VEM4 includes a VM4 mechanical interlock unit with 2 fixing clips (BB4), a VE4 electrical interlock block. VE4 block must be used with A2-A2 connection to respect the electrical connection diagram. - VEM4 not fittable on AF..Z contactors with DC control voltage 12...20 V DC.							
Connecting links with manual motor starters							
AF09 ... AF16	with	MS116-0.16 ... MS116-25, MS132-0.16 ... MS132-25	BEA16-4	1SBN081306T1000		10	0.025
AF26 ... AF38	with	MS116-0.16 ... MS116-16, MS132-0.16 ... MS132-10	BEA26-4	1SBN082306T1000		10	0.025
	with	MS116-20 ... MS116-32, MS132-12 ... MS132-32	BEA38-4	1SBN082306T2000		10	0.030
Connection sets for reversing contactors							
AF09 ... AF16			BER16-4	1SBN081311R1000		1	0.045
AF26 ... AF38			BER38-4	1SBN082311R1000		1	0.100
Connection sets for star-delta starting							
AF09 ... AF16			BEY16-4	1SBN081313R2000		1	0.050
AF26 ... AF38			BEY38-4	1SBN082713R2000		1	0.110
Note: with or without VM4 or VEM4							
Additional coil terminal block							
AF09 ... AF38			LDC4	1SBN070156T1000		10	0.010
Protective covers							
All 1-stack contactors			BX4	1SBN110108T1000		10	0.006
For 4-pole CA4 and 2-pole CAT4 auxiliary contact blocks			BX4-CA	1SBN110109W1000		50	0.001

(1) See "Main accessory fitting details" table.

1SBC101385S0201

A40 3-pole contactors
18.5 kW
AC operated

A40-30-10

Description

A40 contactors are mainly used for controlling 3-phase motors and power circuits up to 690 V AC or 220 V DC.

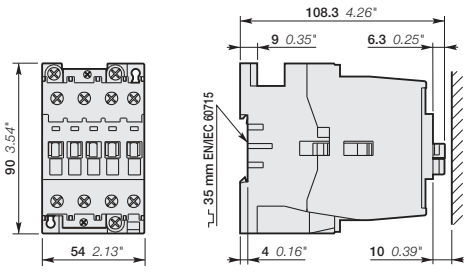
These contactors are of the block type design with:
- 3 main poles and 1 built-in auxiliary contact
- control circuit: AC operated
- add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

Ordering details

IEC		UL/CSA		Rated control circuit voltage Uc (1)		Auxiliary contacts fitted		Type	Order code		Weight
Rated operational power 400 V AC-3	current θ ≤ 40 °C AC-1	3-phase motor rating 480 V	General use rating 600 V AC								Pkg (1 pce)
kW	A	hp	A	V 50 Hz	V 60 Hz						kg
18.5	60	30	60	24	24	1	0	A40-30-10	1SBL321001R8110		0.710
						0	1	A40-30-01	1SBL321001R8101		0.710
				48	48	1	0	A40-30-10	1SBL321001R8310		0.710
						0	1	A40-30-01	1SBL321001R8301		0.710
				110	110...120	1	0	A40-30-10	1SBL321001R8410		0.710
						0	1	A40-30-01	1SBL321001R8401		0.710
				220...230	230...240	1	0	A40-30-10	1SBL321001R8010		0.710
						0	1	A40-30-01	1SBL321001R8001		0.710
				230...240	240...260	1	0	A40-30-10	1SBL321001R8810		0.710
						0	1	A40-30-01	1SBL321001R8801		0.710
				380...400	400...415	1	0	A40-30-10	1SBL321001R8510		0.710
						0	1	A40-30-01	1SBL321001R8501		0.710
				400...415	415...440	1	0	A40-30-10	1SBL321001R8610		0.710
						0	1	A40-30-01	1SBL321001R8601		0.710

(1) Other control voltages see voltage code table.

Main dimensions mm, *inches*



A40

1SBC101362S0201

A50 ... A75 3-pole contactors
22 to 37 kW
AC operated

A50-30-00

Description

A50 ... A75 contactors are mainly used for controlling 3-phase motors and power circuits up to 690 V AC / 1000 V AC or 220 V DC.

These contactors are of the block type design with:

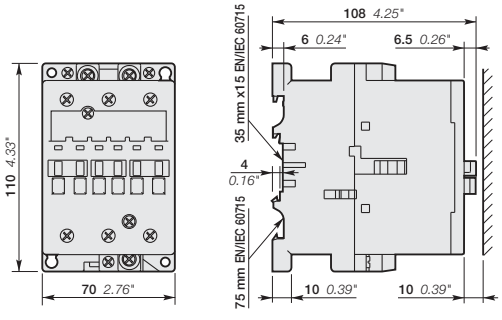
– 3 main poles
– control circuit: AC operated
– add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

Ordering details

IEC		UL/CSA		Rated control circuit voltage Uc (1)		Auxiliary contacts fitted		Type	Order code		Weight
Rated operational power 400 V AC-3	current θ ≤ 40 °C AC-1	3-phase motor rating 480 V	General use rating 600 V AC								Pkg (1 pce)
kW	A	hp	A	V 50 Hz	V 60 Hz						kg
22	100	40	80	24	24	0	0	A50-30-00	1SBL351001R8100		1.160
				48	48	0	0	A50-30-00	1SBL351001R8300		1.160
				110	110...120	0	0	A50-30-00	1SBL351001R8400		1.160
				220...230	230...240	0	0	A50-30-00	1SBL351001R8000		1.160
				230...240	240...260	0	0	A50-30-00	1SBL351001R8800		1.160
				380...400	400...415	0	0	A50-30-00	1SBL351001R8500		1.160
				400...415	415...440	0	0	A50-30-00	1SBL351001R8600		1.160
30	115	60	90	24	24	0	0	A63-30-00	1SBL371001R8100		1.160
				48	48	0	0	A63-30-00	1SBL371001R8300		1.160
				110	110...120	0	0	A63-30-00	1SBL371001R8400		1.160
				220...230	230...240	0	0	A63-30-00	1SBL371001R8000		1.160
				230...240	240...260	0	0	A63-30-00	1SBL371001R8800		1.160
				380...400	400...415	0	0	A63-30-00	1SBL371001R8500		1.160
				400...415	415...440	0	0	A63-30-00	1SBL371001R8600		1.160
37	125	60	105	24	24	0	0	A75-30-00	1SBL411001R8100		1.160
				48	48	0	0	A75-30-00	1SBL411001R8300		1.160
				110	110...220	0	0	A75-30-00	1SBL411001R8400		1.160
				220...230	230...240	0	0	A75-30-00	1SBL411001R8000		1.160
				230...240	240...260	0	0	A75-30-00	1SBL411001R8800		1.160
				380...400	400...415	0	0	A75-30-00	1SBL411001R8500		1.160
				400...415	415...440	0	0	A75-30-00	1SBL411001R8600		1.160

(1) Other control voltages see voltage code table.

Main dimensions mm, *inches*



A50, A63, A75

1SBC101363S0201

AL40 3-pole contactors
18.5 kW
DC operated

AL40-30-10

Description

AL40 contactors are mainly used for controlling 3-phase motors and power circuits up to 690 V AC or 220 V DC.

These contactors are of the block type design with:

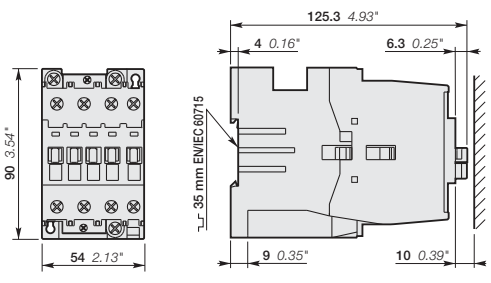
– 3 main poles and 1 built-in auxiliary contact
– control circuit: low consumption (3.5 W at pull-in and holding) DC operated with solid core magnet Suitable for direct control by PLC outputs (the polarity on the coil terminals A1+ and A2- must be respected)
– add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

Ordering details

IEC		UL/CSA		Rated control circuit voltage Uc (1)	Auxiliary contacts fitted		Type	Order code		Weight Pkg (1 pce)
Rated operational power 400 V AC-3	current θ ≤ 40 °C AC-1	3-phase motor rating 480 V	General use rating 600 V AC							
kW	A	hp	A	V DC						kg
18.5	60	30	60	12	1	0	AL40-30-10	1SBL323001R8010		0.850
					0	1	AL40-30-01	1SBL323001R8001		0.850
				24	1	0	AL40-30-10	1SBL323001R8110		0.850
					0	1	AL40-30-01	1SBL323001R8101		0.850
				48	1	0	AL40-30-10	1SBL323001R8310		0.850
					0	1	AL40-30-01	1SBL323001R8301		0.850
				60	1	0	AL40-30-10	1SBL323001R8410		0.850
					0	1	AL40-30-01	1SBL323001R8401		0.850
				110	1	0	AL40-30-10	1SBL323001R8610		0.850
					0	1	AL40-30-01	1SBL323001R8601		0.850
				125	1	0	AL40-30-10	1SBL323001R8710		0.850
					0	1	AL40-30-01	1SBL323001R8701		0.850
				220	1	0	AL40-30-10	1SBL323001R8810		0.850
					0	1	AL40-30-01	1SBL323001R8801		0.850
				240	1	0	AL40-30-10	1SBL323001R8910		0.850
					0	1	AL40-30-01	1SBL323001R8901		0.850

(1) Other control voltages see voltage code table.

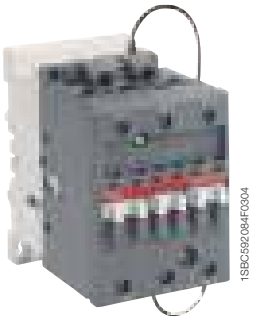
Main dimensions mm, *inches*



AL40

1SBC101365S0201

AE50 ... AE75 3-pole contactors
22 to 37 kW
DC operated



AE50-30-00

Description

AE50 ... AE75 contactors are mainly used for controlling 3-phase motors and power circuits up to 690 V AC / 1000 V AC or 220 V DC.

These contactors are of the block type design with:

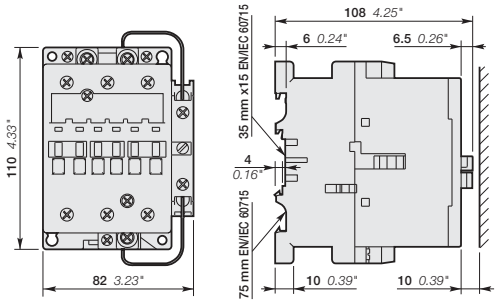
– 3 main poles
– control circuit: DC operated with double winding coil (and factory-mounted lagging contact for "holding" winding insertion)
– add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

Ordering details

IEC		UL/CSA		Rated control circuit voltage Uc (1)	Auxiliary contacts fitted		Type	Order code		Weight Pkg (1 pce)
Rated operational power 400 V AC-3	current θ ≤ 40 °C AC-1	3-phase motor rating 480 V	General use rating 600 V AC							
kW	A	hp	A	V DC						kg
22	100	40	80	12	0	0	AE50-30-00	1SBL359001R8000		1.200
				24	0	0	AE50-30-00	1SBL359001R8100		1.200
				48	0	0	AE50-30-00	1SBL359001R8300		1.200
				60	0	0	AE50-30-00	1SBL359001R8400		1.200
				110	0	0	AE50-30-00	1SBL359001R8600		1.200
				125	0	0	AE50-30-00	1SBL359001R8700		1.200
				220	0	0	AE50-30-00	1SBL359001R8800		1.200
				240	0	0	AE50-30-00	1SBL359001R8900		1.200
30	115	60	90	12	0	0	AE63-30-00	1SBL379001R8000		1.200
				24	0	0	AE63-30-00	1SBL379001R8100		1.200
				48	0	0	AE63-30-00	1SBL379001R8300		1.200
				60	0	0	AE63-30-00	1SBL379001R8400		1.200
				110	0	0	AE63-30-00	1SBL379001R8600		1.200
				125	0	0	AE63-30-00	1SBL379001R8700		1.200
				220	0	0	AE63-30-00	1SBL379001R8800		1.200
				240	0	0	AE63-30-00	1SBL379001R8900		1.200
37	125	60	105	12	0	0	AE75-30-00	1SBL419001R8000		1.200
				24	0	0	AE75-30-00	1SBL419001R8100		1.200
				48	0	0	AE75-30-00	1SBL419001R8300		1.200
				60	0	0	AE75-30-00	1SBL419001R8400		1.200
				110	0	0	AE75-30-00	1SBL419001R8600		1.200
				125	0	0	AE75-30-00	1SBL419001R8700		1.200
				220	0	0	AE75-30-00	1SBL419001R8800		1.200
				240	0	0	AE75-30-00	1SBL419001R8900		1.200

(1) Other control voltages see voltage code table.

Main dimensions mm, *inches*



AE50, AE63, AE75

1SBC101366S0201

AF50 ... AF75 3-pole contactors
22 to 37 kW
AC / DC operated

AF50-30-00

5

Description

AF50 ... AF75 contactors are mainly used for controlling 3-phase motors and generally for controlling power circuits up to 690 V AC and 220 V DC.

These contactors are of the block type design with:

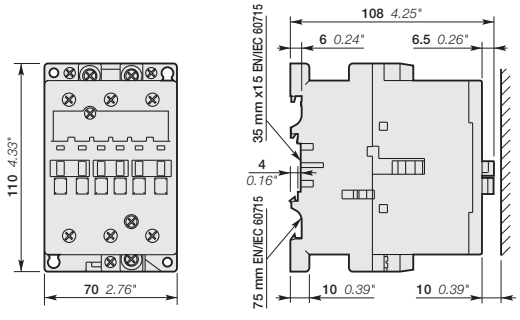
– 3 main poles
– control circuit: AC or DC operated with electronic coil interface accepting a wide control voltage range (e.g. 100...250 V AC and DC)
  - can manage large control voltage variations
  - only 3 coils to cover control voltages between 48...250 V 50/60 Hz and 20...250 V DC
  - reduced panel energy consumption
  - very distinct closing and opening
  - can withstand short voltage dips and voltage sags (SEMI F47 conditions of use on request).
– built-in surge suppression
– add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

Ordering details

IEC		UL/CSA		Rated control circuit voltage Uc min. ... Uc max.		Auxiliary contacts fitted		Type	Order code		Weight
Rated operational power 400 V AC-3	current θ ≤ 40 °C AC-1	3-phase motor rating 480 V	General use rating 600 V AC								Pkg (1 pce)
kW	A	hp	A	V 50 Hz	V 60 Hz						kg
22	100	40	80	-	20...60	0	0	AF50-30-00	1SBL357001R7200	(1)	1.180
				48...130	48...130	0	0	AF50-30-00	1SBL357001R6900		1.180
				100...250	100...250	0	0	AF50-30-00	1SBL357001R7000		1.180
30	115	60	90	-	20...60	0	0	AF63-30-00	1SBL377001R7200	(1)	1.180
				48...130	48...130	0	0	AF63-30-00	1SBL377001R6900		1.180
				100...250	100...250	0	0	AF63-30-00	1SBL377001R7000		1.180
37	125	60	105	-	20...60	0	0	AF75-30-00	1SBL417001R7200	(1)	1.180
				48...130	48...130	0	0	AF75-30-00	1SBL417001R6900		1.180
				100...250	100...250	0	0	AF75-30-00	1SBL417001R7000		1.180

(1) The connection polarities indicated close to the coil terminals must be respected: A1 for the positive pole and A2 for the negative pole.

Main dimensions mm, *inches*



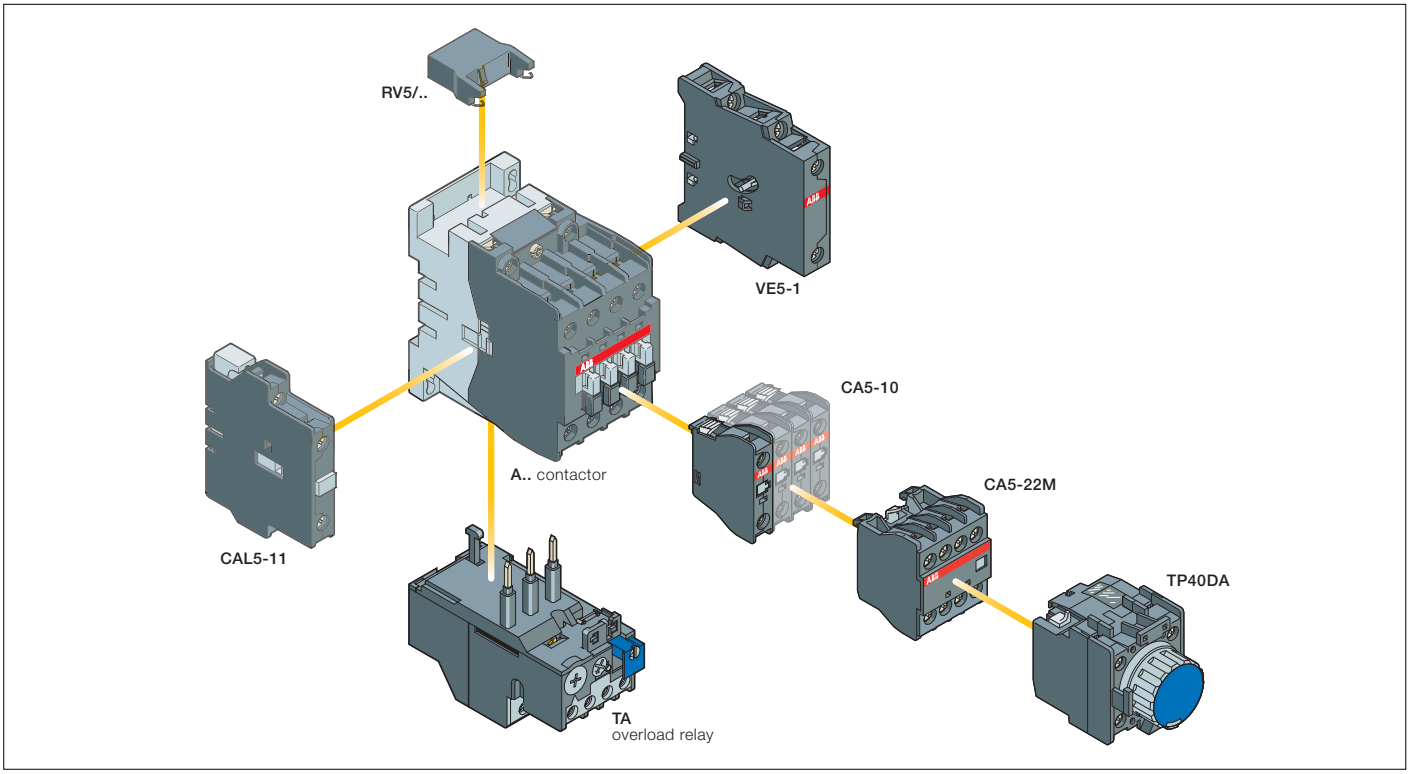
AF50, AF63, AF75

1SBC101368S0201

Notes

A40 … A75, AL, AE and AF50 … AF75 3-pole contactors
Main accessories

Contactor and main accessories (other accessories available)



Main accessory fitting details

Many configurations of accessories are possible depending on whether these are front-mounted or side-mounted.

Contactor types	Main poles	Built-in auxiliary contacts	Front-mounted accessories: Auxiliary contact blocks				Pneumatic timer		Side-mounted accessories: Auxiliary contact blocks		Interlock unit
			1-pole CA5-..		4-pole CA5-..		TP.. A		2-pole CAL5-11		VM5-.. or VE5-..
A40	3 0 3 0	1 0 0 1 (2)	1 to 5 x CA5-..	or	1 x CA5-.. (4-pole) + 1 x 1-pole CA5-..	or	1 x TP .. A + 1 x CA5-.. (1-pole)	+	1 to 2 x CAL5-11	or	1 x VM5-1 or VE5-1 +1 x CAL5-11
A50 ... A75	3 0	0 0	1 to 6 x CA5-..	or	1 x CA5-.. (4-pole) + 2 x 1-pole CA5-..	or	1 x TP .. A + 2 x CA5-.. (1-pole)	+	1 to 2 x CAL5-11	or	1 x VE5-2 +1 x CAL5-11
AL40	3 0 3 0	1 0 0 1	1 to 5 x CA5-.. (2)	or	1 x CA5-.. (4-pole) (2) + 1 x 1-pole CA5-..		–	or	1 x CAL5-11 (3)	+	1 x VM5-1 or VE5-1 (1)
AE50 ... AE75	3 0	0 0	1 to 6 x CA5-..	or	1 x CA5-.. (4-pole) + 2 x 1-pole CA5-..	or	1 x TP .. A + 2 x CA5-.. (1-pole)	+	1 x CAL5-11	or	1 x VE5-2
AF50 ... AF75	3 0	0 0	1 to 6 x CA5-..	or	1 x CA5-.. (4-pole) + 2 x 1-pole CA5-..	or	1 x TP .. A + 2 x CA5-.. (1-pole)	+	1 to 2 x CAL5-11	or	1 x VE5-2 +1 x CAL5-11

(1) With VE5-1 interlock unit, a maximum of 3 N.O. auxiliary contacts are permitted. VE5-1, VM5-1 not allowed in mounting position 1 ±30°.
(2) 2 N.C. CA5-.. auxiliary contacts maximum in mounting position 5.
(3) CAL5-11 not allowed in mounting position 1±30°.

Overload relays fitting details (4)

Contactor types	Thermal overload relays	Electronic overload relays
A40, AL40	TA25DU (0.1...32 A) or TA42DU (18...42 A)	E45DU (9...45 A)
A50 … A75, AE50 … AE75, AF50 … AF75	TA75DU (18...80 A)	E80DU (27...80 A)

The addition of an overload relay on the contactor does not prevent fitting of many other accessories as shown above.
(4) Direct mounting - No kit required.

1SBC101386S0201

A40 … A75, AL, AE and AF50 … AF75 3-pole contactors
Main accessories

CA5-10

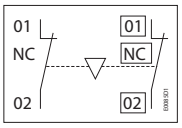
CAL5-11

RV5/50

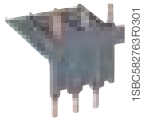
TP40DA

BX-TP

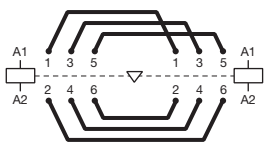
VE5-1



VE5-1, VE5-2
Terminal marking and positioning



BEA40/450



BER, BEM connection sets

Ordering details (1)

For contactors	Auxiliary contacts		Type	Order code		Pkg qty	Weight (1 pce)
							kg
Front-mounted instantaneous auxiliary contact blocks							
A40 … A75, AL40, AE50 … AE75, AF50 … AF75	1	–	CA5-10	1SBN010010R1010		10	0.014
	–	1	CA5-01	1SBN010010R1001		10	0.014
A40-30-10, AL40-30-10	2	2	CA5-22M	1SBN010040R1122		2	0.060
A40-30-01, AL40-30-01	2	2	CA5-22U	1SBN010040R1322		2	0.060
A50 … A75, AE50 … AE75, AF50 … AF75	2	2	CA5-22E	1SBN010040R1022		2	0.060
Side-mounted instantaneous auxiliary contact block							
A40 … A75, AL40, AE50 … AE75, AF50 … AF75	1	1	CAL5-11	1SBN010020R1011		2	0.050
Pneumatic timer blocks							
A40 … A75, AE50 … AE75, AF50 … AF75	delay on energization	0.1…40 s	1	1	TP40DA	1SBN020300R1000		1	0.070
		10…180 s	1	1	TP180DA	1SBN020300R1001		1	0.070
	delay on de-energization	0.1…40 s	1	1	TP40IA	1SBN020301R1000		1	0.070
		10…180 s	1	1	TP180IA	1SBN020301R1001		1	0.070
Timer accessory	plastic sealable cover		–	–	BX-TP	FPTN472657R0001		1	0.006
Interlock units							
A40, AL40	Mechanical		–	–	VM5-1	1SBN030100R1000		1	0.066
	Mechanical and electrical		–	2	VE5-1	1SBN030110R1000		1	0.076
A50 … A75, AE50 … AE75, AF50 … AF75	Mechanical and electrical		–	2	VE5-2	1SBN030210R1000		1	0.146

Surge suppressors

For contactors	Rated control circuit voltage Uc			Type	Order code		Pkg qty	Weight (1 pce)
	V	AC	DC					kg
A40 … A75 AL40 AE40 … AE75	24…50	●	●	RV5/50	1SBN050010R1000		2	0.015
	50…133	●	●	RV5/133	1SBN050010R1001		2	0.015
	110…250	●	●	RV5/250	1SBN050010R1002		2	0.015
	250…440	●	●	RV5/440	1SBN050010R1003		2	0.015
A40	24…50	●	–	RC5-1/50	1SBN050100R1000		2	0.012
	50…133	●	–	RC5-1/133	1SBN050100R1001		2	0.012
	110…250	●	–	RC5-1/250	1SBN050100R1002		2	0.012
	250…440	●	–	RC5-1/440	1SBN050100R1003		2	0.012
A50 … A75	24…50	●	–	RC5-2/50	1SBN050200R1000		2	0.015
	50…133	●	–	RC5-2/133	1SBN050200R1001		2	0.015
	110…250	●	–	RC5-2/250	1SBN050200R1002		2	0.015
	250…440	●	–	RC5-2/440	1SBN050200R1003		2	0.015
AL40 AE50 … AE75	12…32	–	●	RT5/32	1SBN050020R1000		2	0.015
	25…65	–	●	RT5/65	1SBN050020R1001		2	0.015
	50…90	–	●	RT5/90	1SBN050020R1002		2	0.015
	77…150	–	●	RT5/150	1SBN050020R1003		2	0.015
	150…264	–	●	RT5/264	1SBN050020R1004		2	0.015

Connecting links with manual motor starters

A40	For MS450 manual motor starter	BEA40/450	1SBN083206R1000		1	0.061
A50, AE50, AF50	For MS450 manual motor starter	BEA50/450	1SBN083506R1000		1	0.062
A50 … A75, AE50 … AE75, AF50 … AF75	For MS495 manual motor starter	BEA75/495	1SBN084106R1000		1	0.120

Connection sets for reversing contactors

A40	BER40V	1SBN082411R1000		1	0.085
A50 … A75, AE50 … AE75, AF50 … AF75	BEM75-30	1SBN083501R1000		1	0.243

(1) See "Main accessory fitting details" table.

1SBC101387S0201

A95 ... A110 3-pole contactors
45 to 55 kW
AC operated

A95-30-00

5

Description

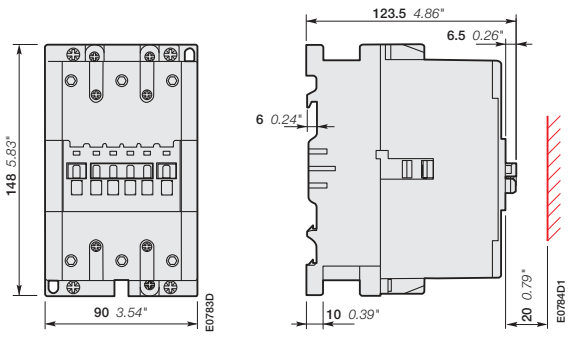
A95 ... A110 contactors are mainly used for controlling 3-phase motors and power circuits up to 690 / 1000 V AC or 220 V DC.
These contactors are of the block type design with:
– 3 main poles
– control circuit: AC operated
– add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

Ordering details

IEC		UL/CSA		Rated control circuit voltage Uc (1)		Auxiliary contacts fitted		Type	Order code		Weight
Rated operational power 400 V AC-3	current θ ≤ 40 °C 690 V AC-1	3-phase motor rating 480 V	General use rating 600 V AC								Pkg (1 pce)
kW	A	hp	A	V 50 Hz	V 60 Hz						kg
45	145	60	125	24	24	0	0	A95-30-00	1SFL431001R8100		2.000
				48	48	0	0	A95-30-00	1SFL431001R8300		2.000
				110	110...120	0	0	A95-30-00	1SFL431001R8400		2.000
				220...230	230...240	0	0	A95-30-00	1SFL431001R8000		2.000
				230...240	240...260	0	0	A95-30-00	1SFL431001R8800		2.000
				380...400	400...415	0	0	A95-30-00	1SFL431001R8500		2.000
				400...415	415...440	0	0	A95-30-00	1SFL431001R8600		2.000
55	160	75	140	24	24	0	0	A110-30-00	1SFL451001R8100		2.000
				48	48	0	0	A110-30-00	1SFL451001R8300		2.000
				110	110...120	0	0	A110-30-00	1SFL451001R8400		2.000
				220...230	230...240	0	0	A110-30-00	1SFL451001R8000		2.000
				230...240	240...260	0	0	A110-30-00	1SFL451001R8800		2.000
				380...400	400...415	0	0	A110-30-00	1SFL451001R8500		2.000
				400...415	415...440	0	0	A110-30-00	1SFL451001R8600		2.000

(1) Other control voltages see voltage code table.

Main dimensions mm, *inches*



A95, A110

1SFC101007C0201

AF95 ... AF110 3-pole contactors
45 to 55 kW
AC / DC operated

AF95-30-00

Description

AF95 ... AF110 contactors are mainly used for controlling 3-phase motors and power circuits up to 690 / 1000 V AC or 220 V DC.

These contactors are of the block type design with:

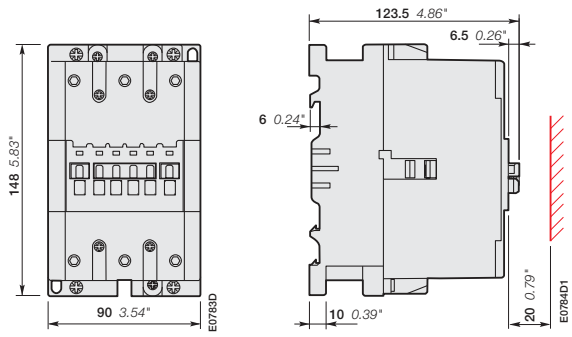
– 3 main poles
– control circuit: AC or DC operated with electronic coil interface accepting a wide control voltage range (e.g. 100...250 V AC and DC)
– can manage large control voltage variations
  - only 3 coils to cover control voltages between 48...250 V 50/60 Hz and 20...250 V DC
  - reduced panel energy consumption
  - very distinct closing and opening
  - can withstand short voltage dips and voltages sags (SEMI F47 conditions of use on request).
– built-in surge suppression
– add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

Ordering details

IEC		UL/CSA		Rated control circuit voltage Uc min. ... Uc max.		Auxiliary contacts fitted		Type	Order code		Weight
Rated operational power 400 V AC-3	current θ ≤ 40 °C 690 V AC-1	3-phase motor rating 480 V	General use rating 600 V AC								Pkg (1 pce)
kW	A	hp	A	V 50/60 Hz	V DC						kg
45	145	60	125	-	20...60	0	0	AF95-30-00	1SFL437001R7200 (1)		2.030
				48...130	48...130	0	0	AF95-30-00	1SFL437001R6900		2.030
				100...250	100...250	0	0	AF95-30-00	1SFL437001R7000		2.030
55	160	75	140	-	20...60	0	0	AF110-30-00	1SFL457001R7200 (1)		2.030
				48...130	48...130	0	0	AF110-30-00	1SFL457001R6900		2.030
				100...250	100...250	0	0	AF110-30-00	1SFL457001R7000		2.030

(1) The connection polarities indicated close to the coil terminals must be respected: A1 for the positive pole and A2 for the negative pole.

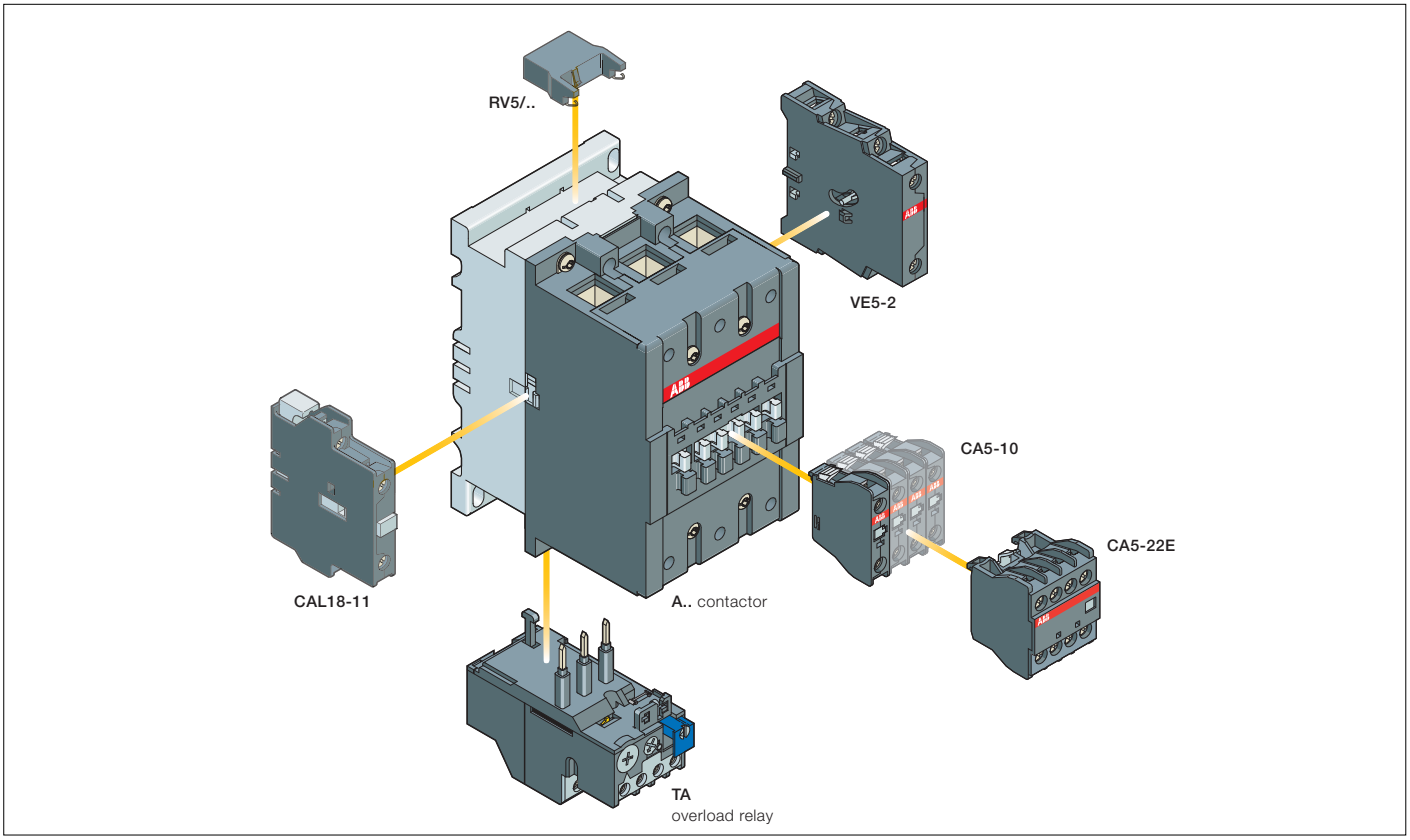
Main dimensions mm, *inches*



AF95, AF110

A95, A110 and
AF95, AF110 3-pole contactors
Main accessories

Contactor and main accessories (other accessories available)



Main accessory fitting details

Many configurations of accessories are possible depending on whether these are front-mounted or side-mounted.

Contactor types	Main poles	Available auxiliary contacts	Front-mounted accessories Auxiliary contact blocks				Side-mounted accessories Auxiliary contact blocks		Interlock unit
			1-pole CA5- ..		4-pole CA5- ..		2-pole CAL..		VE5-2
A95, A110	3 0	0 0	1 to 6 x CA5-..	or	1 x CA5-.. (4-pole) + 2 x 1-pole CA5-..	+	1 to 2 x CAL18-11	or	1 x VE5-2 +1 x CAL18-11
AF95, AF110	3 0	0 0	1 to 6 x CA5-..	or	1 x CA5-.. (4-pole) + 2 x 1-pole CA5-..	+	1 to 2 x CAL18-11	or	1 x VE5-2 +1 x CAL18-11

Overload relays fitting details (1)

Contactor types	Thermal overload relays	Electronic overload relays
A95, A110 AF95, AF110	TA80DU (29...80 A) or TA110DU (65...110 A)	E140DU (50...140 A)

The addition of an overload relay on the contactor does not prevent fitting of many other accessories as shown above.
(1) Direct mounting - No kit required.

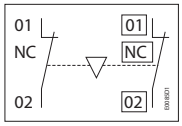
1SFC101026C0201

A95, A110 and
AF95, AF110 3-pole contactors
Main accessories

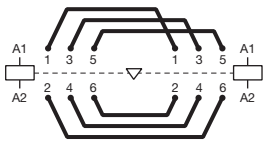
CA5-10

CAL18-11

RV5/50



VE5-1, VE5-2
Terminal marking and positioning



BEM... connection set

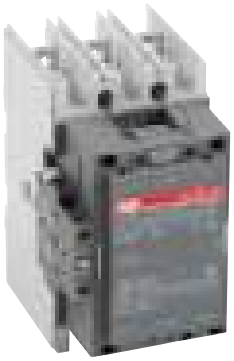
Ordering details (1)

For contactors	Auxiliary contacts		Type	Order code		Pkg qty	Weight (1 pce) kg
Front-mounted instantaneous auxiliary contact blocks							
A95, A110 and AF95, AF110	1	–	CA5-10	1SBN010010R1010		10	0.014
	–	1	CA5-01	1SBN010010R1001		10	0.014
A95, A110 and AF95, AF110	2	2	CA5-22E	1SBN010040R1022		2	0.060
Side-mounted instantaneous auxiliary contact blocks							
A95, A110 and AF95, AF110	1	1	CAL18-11	1SFN010720R1011		2	0.050
Mechanical and electrical interlock unit							
A95, A110 and AF95, AF110	–	2	VE5-2	1SBN030210R1000		1	0.146

For contactors	Rated control circuit voltage Uc			Type	Order code		Pkg qty	Weight (1 pce)
	V	AC	DC					kg
Surge suppressors								
A95 ... A110	24...50	●	●	RV5/50	1SBN050010R1000		2	0.015
	50...133	●	●	RV5/133	1SBN050010R1001		2	0.015
	110...250	●	●	RV5/250	1SBN050010R1002		2	0.015
	250...440	●	●	RV5/440	1SBN050010R1003		2	0.015
A95 ... A110	24...50	●	–	RC5-2/50	1SBN050200R1000		2	0.015
	50...133	●	–	RC5-2/133	1SBN050200R1001		2	0.015
	110...250	●	–	RC5-2/250	1SBN050200R1002		2	0.015
	250...440	●	–	RC5-2/440	1SBN050200R1003		2	0.015
Connecting links with manual motor starters								
A95, A110 and AF95, AF110	For MS495			BEA110/495	1SBN084506R1000		1	0.124
Connection set for reversing contactors								
A95, A110 and AF95, AF110				BEM110-30	1SFN084301R1000		1	0.450
Mounting plate for mechanical interlocked contactors								
A95, A110 and AF95, AF110				PN110-21	1SFN094301R1000		1	0.600

(1) See "Main accessory fitting details" table.

A145 ... A300 3-pole contactors
75 to 160 kW
AC operated with 1 N.O. + 1 N.C. auxiliary contacts



A185-30-11

A300-30-11

Description

A145 ... A300 contactors are mainly used for controlling 3-phase motors and power circuits up to 690 / 1000 V AC (2) or 220 V DC.

These contactors are of the block type design with:

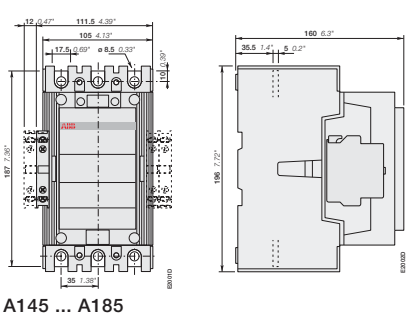
– 3 main poles
– control circuit: AC operated
– add-on auxiliary contact blocks for side mounting and a wide range of accessories.

Ordering details

IEC		UL/CSA		Rated control circuit voltage Uc (1)		Auxiliary contacts fitted		Type	Order code		Weight
Rated operational power 400 V AC-3	current θ ≤ 40 °C 690 V AC-1	3-phase motor rating 480 V	General use rating 600 V AC								Pkg (1 pce)
kW	A	hp	A	V 50 Hz	V 60 Hz						kg
75	250	100	230	24	24	1	1	A145-30-11	1SFL471001R8111		3.500
				48	48	1	1	A145-30-11	1SFL471001R8311		3.500
				110	110...120	1	1	A145-30-11	1SFL471001R8411		3.500
				220...230	230...240	1	1	A145-30-11	1SFL471001R8011		3.500
				230...240	240...260	1	1	A145-30-11	1SFL471001R8811		3.500
				380...400	400...415	1	1	A145-30-11	1SFL471001R8511		3.500
				400...415	415...440	1	1	A145-30-11	1SFL471001R8611		3.500
90	275	125	250	24	24	1	1	A185-30-11	1SFL491001R8111		3.500
				48	48	1	1	A185-30-11	1SFL491001R8311		3.500
				110	110...120	1	1	A185-30-11	1SFL491001R8411		3.500
				220...230	230...240	1	1	A185-30-11	1SFL491001R8011		3.500
				230...240	240...260	1	1	A185-30-11	1SFL491001R8811		3.500
				380...400	400...415	1	1	A185-30-11	1SFL491001R8511		3.500
				400...415	415...440	1	1	A185-30-11	1SFL491001R8611		3.500
110	350	150	300	24	24	1	1	A210-30-11	1SFL511001R8111		6.100
				48	48	1	1	A210-30-11	1SFL511001R8311		6.100
				110	110...120	1	1	A210-30-11	1SFL511001R8411		6.100
				220...230	230...240	1	1	A210-30-11	1SFL511001R8011		6.100
				230...240	240...260	1	1	A210-30-11	1SFL511001R8811		6.100
				380...400	400...415	1	1	A210-30-11	1SFL511001R8511		6.100
				400...415	415...440	1	1	A210-30-11	1SFL511001R8611		6.100
140	400	200	350	24	24	1	1	A260-30-11	1SFL531001R8111		6.100
				48	48	1	1	A260-30-11	1SFL531001R8311		6.100
				110	110...120	1	1	A260-30-11	1SFL531001R8411		6.100
				220...230	230...240	1	1	A260-30-11	1SFL531001R8011		6.100
				230...240	240...260	1	1	A260-30-11	1SFL531001R8811		6.100
				380...400	400...415	1	1	A260-30-11	1SFL531001R8511		6.100
				400...415	415...440	1	1	A260-30-11	1SFL531001R8611		6.100
160	500	250	400	24	24	1	1	A300-30-11	1SFL551001R8111		6.100
				48	48	1	1	A300-30-11	1SFL551001R8311		6.100
				110	110...120	1	1	A300-30-11	1SFL551001R8411		6.100
				220...230	230...240	1	1	A300-30-11	1SFL551001R8011		6.100
				230...240	240...260	1	1	A300-30-11	1SFL551001R8811		6.100
				380...400	400...415	1	1	A300-30-11	1SFL551001R8511		6.100
				400...415	415...440	1	1	A300-30-11	1SFL551001R8611		6.100

(1) Other control voltages see voltage code table.
(2) 690 V AC for A210 ... A300, 1000 V AC for A145, A185.

Main dimensions mm, *inches*



A145 ... A185

A210 ... A300

1SFC101009C0201

AF145 ... AF300 3-pole contactors
75 to 160 kW
AC / DC operated with 1 N.O. + 1N.C. auxiliary contacts

1SFC101029F0201

AF185-30-11

1SFC101044F201

AF300-30-11

Description

AF145 ... AF300 contactors are mainly used for controlling 3-phase motors and power circuits up to 690 / 1000 V AC (2) or 220 V DC.

These contactors are of the block type design with:

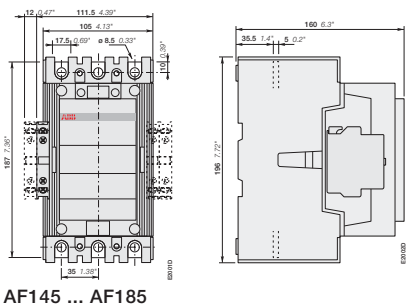
– 3 main poles
– control circuit: AC or DC operated with electronic coil interface accepting a wide control voltage range (e.g. 100...250 V AC and DC)
  - can manage large control voltage variations
  - only 3 coils to cover control voltages between 48...250 V 50/60 Hz and 20...250 V DC
  - reduced panel energy consumption
  - very distinct closing and opening
  - can withstand short voltage dips and voltages sags (SEMI F47 conditions of use on request).
– built-in surge suppression
– add-on auxiliary contact blocks for side mounting and a wide range of accessories.

Ordering details

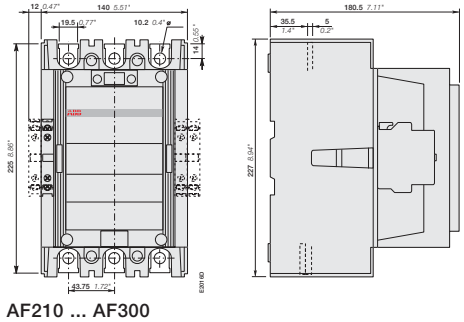
IEC		UL/CSA		Rated control circuit voltage Uc min. ... Uc max.		Auxiliary contacts fitted		Type	Order code		Weight
Rated operational power 400 V AC-3	current θ ≤ 40 °C 690 V AC-1	3-phase motor rating 480 V	General use rating 600 V AC								Pkg (1 pce)
kW	A	hp	A	V 50/60 Hz	V DC						kg
75	250	100	230	-	20...60	1	1	AF145-30-11	1SFL477001R7211 (1)		3.600
				48...130	48...130	1	1	AF145-30-11	1SFL477001R6911		3.600
				100...250	100...250	1	1	AF145-30-11	1SFL477001R7011		3.600
90	275	125	250	-	20...60	1	1	AF185-30-11	1SFL497001R7211 (1)		3.600
				48...130	48...130	1	1	AF185-30-11	1SFL497001R6911		3.600
				100...250	100...250	1	1	AF185-30-11	1SFL497001R7011		3.600
110	350	150	300	-	20...60	1	1	AF210-30-11	1SFL517001R7211 (1)		6.200
				48...130	48...130	1	1	AF210-30-11	1SFL517001R6911		6.200
				100...250	100...250	1	1	AF210-30-11	1SFL517001R7011		6.200
140	400	200	350	-	20...60	1	1	AF260-30-11	1SFL537001R7211 (1)		6.200
				48...130	48...130	1	1	AF260-30-11	1SFL537001R6911		6.200
				100...250	100...250	1	1	AF260-30-11	1SFL537001R7011		6.200
160	500	250	400	-	20...60	1	1	AF300-30-11	1SFL557001R7211 (1)		6.200
				48...130	48...130	1	1	AF300-30-11	1SFL557001R6911		6.200
				100...250	100...250	1	1	AF300-30-11	1SFL557001R7011		6.200

(1) The connection polarities indicated close to the coil terminals must be respected: A1 for the positive pole and A2 for the negative pole.
(2) 690 V AC for AF210 ... AF300, 1000 V AC for AF145, AF185.

Main dimensions mm, *inches*



AF145 ... AF185



AF210 ... AF300

1SFC101011C0201

AF400 ... AF750 3-pole contactors
200 to 400 kW
AC / DC operated with 1 N.O. + 1 N.C. auxiliary contacts

AF460-30-11

AF750-30-11

Description

AF400 ... AF750 contactors are mainly used for controlling 3-phase motors and power circuits up to 1000 V AC or 600 V DC (2).

These contactors are of the block type design with:

– 3 main poles
– control circuit: AC or DC operated with electronic coil interface accepting a wide control voltage range (e.g. 100...500 V AC and DC)
  - can manage large control voltage variations
  - only 4 coils to cover control voltages between 48...500 V 50/60 Hz and 24...500 V DC
  - reduced panel energy consumption
  - very distinct closing and opening
  - can withstand short voltage dips and voltages sags (SEMI F47 conditions of use on request).
– built-in surge suppression
– add-on auxiliary contact blocks for side mounting and a wide range of accessories.

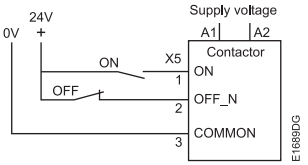
Ordering details

IEC		UL/CSA		Rated control circuit voltage Uc min. ... Uc max.		Auxiliary contacts fitted		Type	Order code		Weight
Rated operational power 400 V AC-3	current θ ≤ 40 °C 690 V AC-1	3-phase motor rating 480 V	General use rating 600 V AC								Pkg (1 pce)
kW	A	hp	A	V 50/60 Hz	V DC						kg
200	600	350	550	-	24...60	1	1	AF400-30-11	1SFL577001R6811 (1)		12.000
				48...130	48...130	1	1	AF400-30-11	1SFL577001R6911		12.000
				100...250	100...250	1	1	AF400-30-11	1SFL577001R7011		12.000
				250...500	250...500	1	1	AF400-30-11	1SFL577001R7111		12.000
250	700	400	650	-	24...60	1	1	AF460-30-11	1SFL597001R6811 (1)		12.000
				48...130	48...130	1	1	AF460-30-11	1SFL597001R6911		12.000
				100...250	100...250	1	1	AF460-30-11	1SFL597001R7011		12.000
				250...500	250...500	1	1	AF460-30-11	1SFL597001R7111		12.000
315	800	500	750	-	24...60	1	1	AF580-30-11	1SFL617001R6811 (1)		15.000
				48...130	48...130	1	1	AF580-30-11	1SFL617001R6911		15.000
				100...250	100...250	1	1	AF580-30-11	1SFL617001R7011		15.000
				250...500	250...500	1	1	AF580-30-11	1SFL617001R7111		15.000
400	1050	600	900	-	24...60	1	1	AF750-30-11	1SFL637001R6811 (1)		15.000
				48...130	48...130	1	1	AF750-30-11	1SFL637001R6911		15.000
				100...250	100...250	1	1	AF750-30-11	1SFL637001R7011		15.000
				250...500	250...500	1	1	AF750-30-11	1SFL637001R7111		15.000

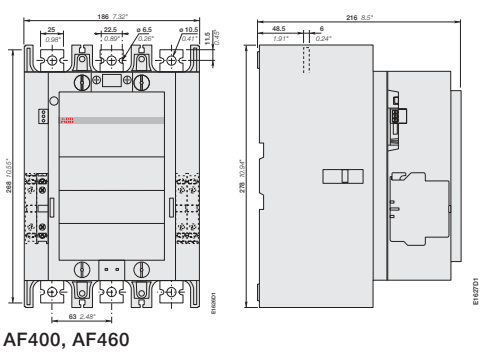
(1) The connection polarities indicated close to the coil terminals must be respected: A1 for the positive pole and A2 for the negative pole.
(2) Up to 850 V DC for AF580, AF750.

AF400 ... AF750 are equipped with low voltage inputs for control, for example by a PLC.

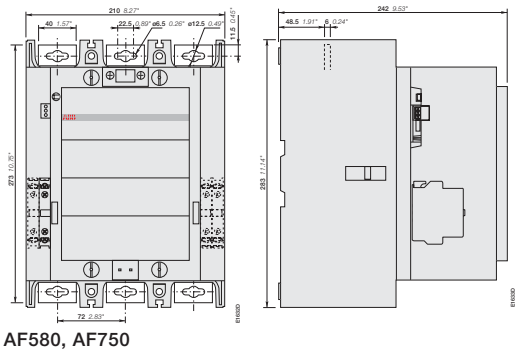
Control inputs



Main dimensions mm, *inches*



AF400, AF460



AF580, AF750

1SFC101013C0201

AF1250 ... AF2050 3-pole contactors
475 to 560 kW and 1250 to 2050 A AC-1
AC / DC operated with 1 N.O. + 1 N.C. auxiliary contacts

AF1250-30-11

AF1650-30-11

Description

AF1250 ... AF2050 contactors are mainly used for controlling power circuits up to 1000 V AC or 850 V DC.

These contactors are of the block type design with:

– 3 main poles
– control circuit: AC or DC operated with electronic coil interface accepting a wide control voltage range (e.g. 100...250 V AC and DC)
  - can manage large control voltage variations
  - only 4 coils for AF1250 to cover control voltages between 48...500 V 50/60 Hz and 24...500 V DC
  - only 1 coil for AF1350 ... AF2050 to cover control voltages between 100...250 V 50/60 Hz and 100...250 V DC
  - reduced panel energy consumption
  - very distinct closing and opening
  - can withstand short voltage dips and voltages sags (SEMI F47 conditions of use on request).
– built-in surge suppression
– add-on auxiliary contact blocks for side mounting and a wide range of accessories.

5

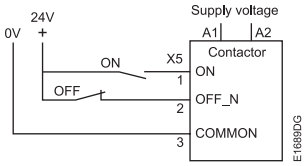
Ordering details

IEC		UL/CSA		Rated control circuit voltage Uc min. ... Uc max. (1)		Auxiliary contacts fitted		Type	Order code		Weight
Rated operational power 400 V AC-3	current θ ≤ 40 °C 690 V AC-1	3-phase motor rating 480 V	General use rating 600 V AC								Pkg (1 pce)
kW	A	hp	A	V 50/60 Hz	V DC						kg
-	1260	-	1210	-	24...60	1	1	AF1250-30-11	1SFL647001R6811 (1)		16.000
				48...130	48...130	1	1	AF1250-30-11	1SFL647001R6911		16.000
				100...250	100...250	1	1	AF1250-30-11	1SFL647001R7011		16.000
				250...500	250...500	1	1	AF1250-30-11	1SFL647001R7111		16.000
475	1350	800	1350	100...250	100...250	1	1	AF1350-30-11	1SFL657001R7011		34.000
560	1650	900	1650	100...250	100...250	1	1	AF1650-30-11	1SFL677001R7011		35.000
-	2050	-	2100	100...250	100...250	1	1	AF2050-30-11	1SFL707001R7011		35.000

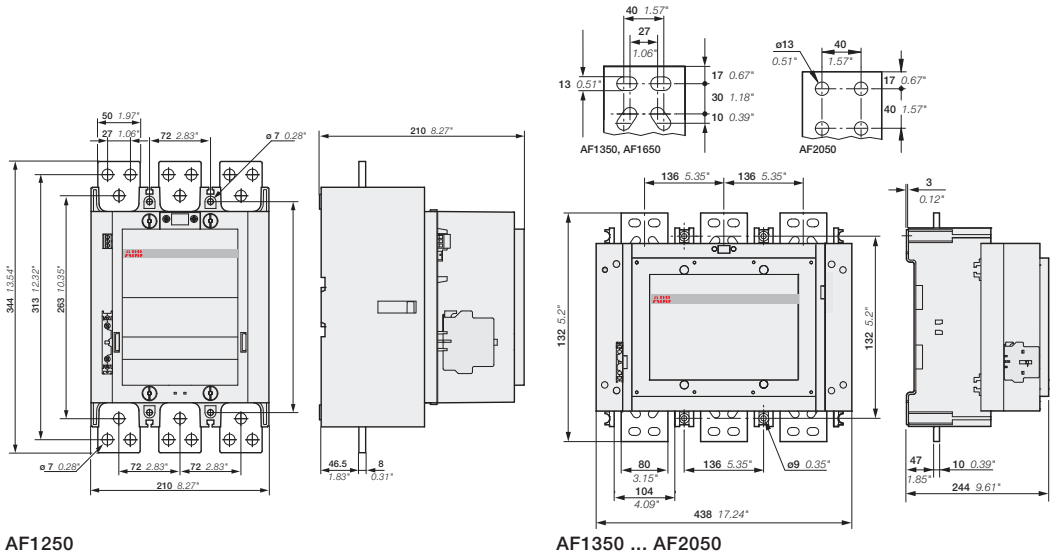
(1) The connection polarities indicated close to the coil terminals must be respected: A1 for the positive pole and A2 for the negative pole.

AF1250 ... AF2050 are equipped with low voltage inputs for control, for example by a PLC.

Control inputs



Main dimensions mm, *inches*

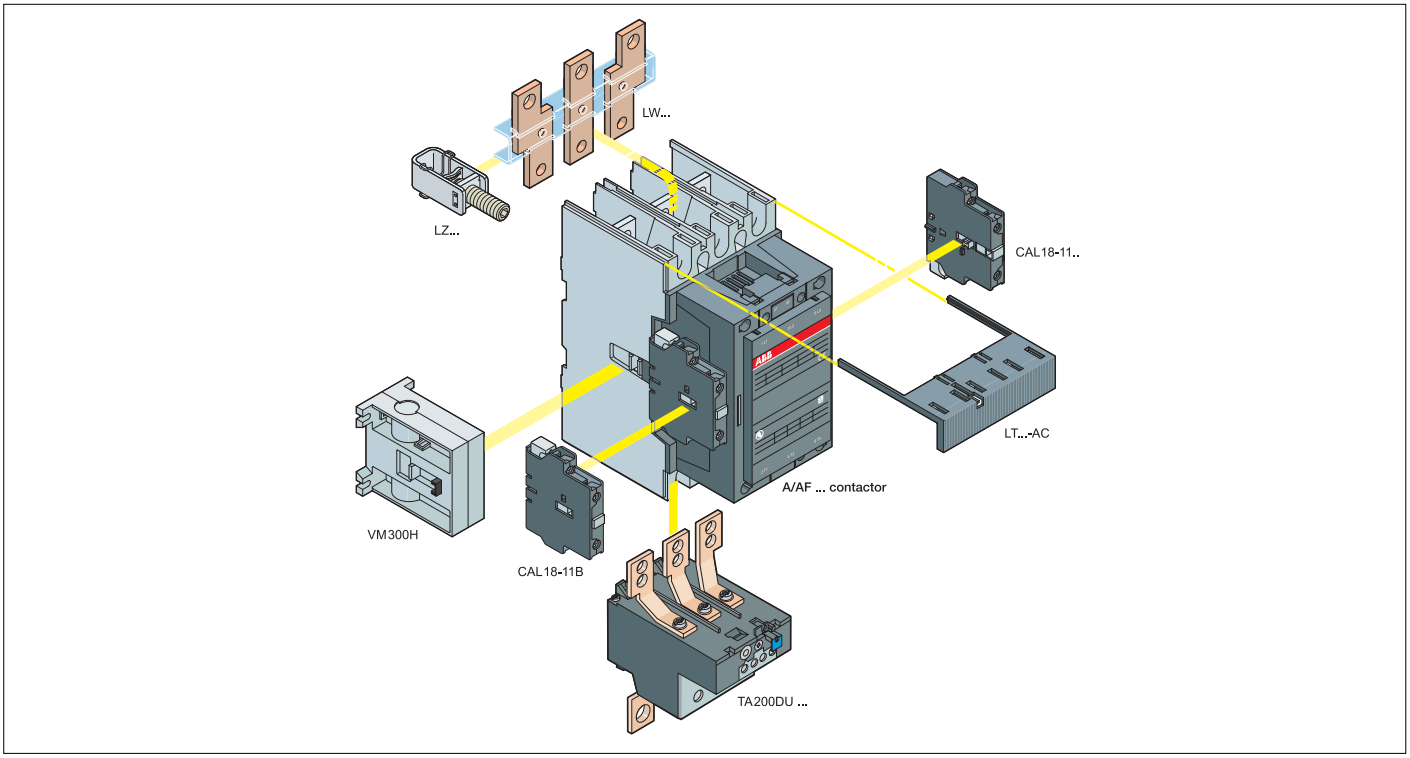


AF1250

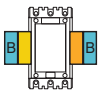
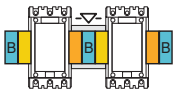
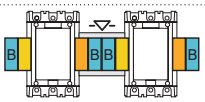
AF1350 ... AF2050

A145 ... A300 and AF145 ... AF2050 3-pole contactors with 1 N.O. + 1 N.C. auxiliary contacts

Main accessories (other accessories available) AF185 shown on picture



Main accessory fitting details

Contactor types	Main poles	Available auxiliary contacts	Side-mounted accessories Add-on auxiliary contact blocks CAL18-11, CAL18-11B (3)				Mechanical interlock units (for two horizontal mounted contactors)	Mounting and positioning Factory mounted auxiliary contacts Add-on CAL18-11 auxiliary contacts Add-on CAL18-11B auxiliary contacts
Contactors + auxiliary contact blocks								
A145 ... A300 AF145 ... AF2050	3 0	1 1	1 x CAL18-11	+	2 x CAL18-11B		–	
Contactors with mechanical interlocking + auxiliary contact blocks								
A145 ... A185 AF145 ... AF185	3 0	1 1	2 x CAL18-11 (1)	+	3 x CAL18-11B (1)	+	VM...H (2)	
A210 ... A300 AF210 ... AF2050	3 0	1 1	2 x CAL18-11 (1)	+	4 x CAL18-11B (1)	+	VM...H (2)	

(1) Total number of auxiliary contact blocks for the two contactors. (2) Interlock type, according to the contactor ratings (see "Accessories").
(3) The CEL18-.. auxiliary contact blocks can replace the CAL18-11 and CAL18-11B. Though, no auxiliary contact block can be mounted outside the CEL18-..

Overload relays fitting details

Contactor types	Thermal overload relays	Electronic overload relays
A145, A185	TA200DU (80...200 A) (4)	E200DU (60...200 A) (4)
A210, A300	TA450DU (100...310 A) (4) or TA450SU (130...310 A) (5)	E320DU (100...320 A) (4)
AF400, AF460	–	E500DU (150...500 A) (5)
AF580, AF750	–	E800DU (250...800 A) (5)
AF1350, AF1650	–	E1250DU (375...1250 A) (5)

The addition of a thermal or electronic overload relay on the contactor does not prevent fitting of many other accessories as shown in "Main accessory fitting details" table.
(4) Direct mounting - No kit required.
(5) Mounting kit required (see "Motor protection").

1SFC101027C0201

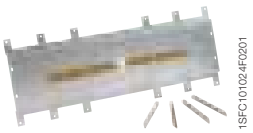
A145 ... A300 and AF145 ... AF2050 3-pole contactors
Main accessories

1SFC101033F0201

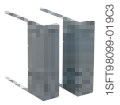
CAL18-11

1SBC580411F0301

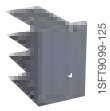
VM300H


1SFC101024F0201

VM1650H


1SFT98099-019C3

LT... AC


1SFT9099-125

LT...AL

1SFT98000-014

LT...AY

1SFT98000-011C3

LW

1SFT98000-012C3

LX

1SFT98099-011C1

LZ...

1SBC580542F0302

LZ...

1SFT98099-095C2

LZ...

Ordering details (1)

For contactors	Auxiliary contacts	Type	Order code		Pkg qty	Weight (1 pce) kg
Side-mounted instantaneous auxiliary contact blocks						
A145 ... A300 and AF145 ... AF2050	1 1	CAL18-11	1SFN010720R1011		2	0.050
	1 1	CAL18-11B	1SFN010720R3311		2	0.050
Mechanical interlock unit for two horizontal mounted contactors						
A145 ... A300		VM300H	1SFN034700R1000		1	0.150
A210 ... A300		VM300/460H	1SFN035100R1000		1	0.150
AF400 ... AF1250		VM750H	1SFN035700R1000		1	0.200
AF1350 ... AF2050		VM1650H	1SFN036503R1000		1	6.000
Terminal shrouds						
A145 ... A185 with connectors		LT185-AC	1SFN124701R1000		2	0.050
A145 ... A185 with lugs		LT185-AL	1SFN124703R1000		2	0.220
A145 ... A185 with short. bar LY185 or between A145 and TA200DU or between A185 and TA200DU		LT185-AY	1SFN124704R1000		1	0.050
A210 ... A300 with connectors		LT300-AC	1SFN125101R1000		2	0.070
A210 ... A300 with lugs		LT300-AL	1SFN125103R1000		2	0.280
A210 ... A300 with short bar LY300		LT300-AY	1SFN125104R1000		1	0.075
AF400 ... AF460 with connectors		LT460-AC	1SFN125701R1000		2	0.100
AF400 ... AF460 with lugs		LT460-AL	1SFN125703R1000		2	0.800
AF580 ... AF750 with connectors		LT750-AC	1SFN126101R1000		2	0.120
AF580 ... AF750 with lugs		LT750-AL	1SFN126103R1000		2	0.825

Terminal enlargements

For contactors	Dimensions hole Ø mm	bar mm	Type	Order code		Pkg qty	Weight (1 pce) kg
A145, A185	10.5	20 x 5	LW185	1SFN074707R1000		1	0.250
A210 ... A300	10.5	25 x 5	LW300	1SFN075107R1000		1	0.450
AF400, AF460	10.5	25 x 5	LW460	1SFN075707R1000		1	0.730
AF580, AF750	13	40 x 6	LW750	1SFN076107R1000		1	1.230
AF1250	13	50 x 10	LW1250	1SFN076407R1000		1	2.000

Terminal extension

A145, A185	8.5	20 x 5	LX185	1SFN074710R1000		1	0.250
A210 ... A300	10.5	20 x 5	LX300	1SFN075110R1000		1	0.350
AF400, AF460	10.5	25 x 5	LX460	1SFN075710R1000		1	0.500
AF580, AF750	13	40 x 6	LX750	1SFN076110R1000		1	0.850

(1) For each contactor type, refer to "Main accessory fitting details" table.

Ordering details (1)

Cables	For contactors	Cable cross section mm²	Type	Order code		Pkg qty	Weight (1 pce) kg
Connector terminals							
Single Cu	A145, A185	6...185	–	1SDA023354R0001		3	0.200
	A210 ... A300	16...240	–	1SDA023368R0001		3	0.400
Single Al & Cu	A145, A185	35...95	–	1SDA023356R0001		3	0.100
	A145, A185	25...150	–	1SDA023357R0001		3	0.100
	A210 ... A300	120...240	–	1SDA023370R0001		3	0.200
Double Cu	A145, A185	2 x (50...120)	LZ185-2C/120	1SFN074709R1000		3	0.300
Double Al & Cu	A210 ... A300	2 x (95...120)	–	1SDA025766R0001		3	0.400
	AF400 ... AF750	2 x (120...240)	–	1SDA023380R0001		3	0.110
Triple Al & Cu	AF400 ... AF750	3 x (70...185)	–	1SDA023384R0001		3	0.265
Multi Al & Cu	AF1350, AF1650	4 x (120...240)	–	1SDA023387R0001		3	0.400

(1) For each contactor type, refer to "Main accessory fitting details" table.
Note: Connectors provided for the A... contactors can be used for the AF types.

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AF09 ... AF38 3-pole contactors
Technical data

Main pole - Utilization characteristics according to IEC

Contactor types	AC / DC operated	AF09	AF12	AF16	AF26	AF30	AF38
Standards		IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1					
Rated operational voltage Ue max.		690 V					
Rated frequency (without derating)		50 / 60 Hz					
Conventional free-air thermal current Ith							
acc. to IEC 60947-4-1, open contactors, θ ≤ 40 °C		35 A	35 A	35 A	50 A	50 A	50 A
With conductor cross-sectional area		6 mm²	6 mm²	6 mm²	10 mm²	10 mm²	10 mm²
AC-1 Utilization category							
For air temperature close to contactor							
Ie / Rated operational current AC-1	**θ ≤ 40 °C**	25 A	28 A	30 A	45 A	50 A	50 A
Ue max. ≤ 690 V, 50/60 Hz	**θ ≤ 60 °C**	25 A	28 A	30 A	40 A	42 A	42 A
	θ ≤ 70 °C	22 A	24 A	26 A	32 A	37 A	37 A
With conductor cross-sectional area		4 mm²	6 mm²	6 mm²	10 mm²	10 mm²	10 mm²
AC-3 Utilization category							
For air temperature close to contactor θ ≤ 60 °C							
Ie / Max. rated operational current AC-3 (1)							
	220-230-240 V	9 A	12 A	18 A	26 A	33 A	40 A
	380-400 V	9 A	12 A	18 A	26 A	32 A	38 A
3-phase motors	**415 V**	9 A	12 A	18 A	26 A	32 A	38 A
	440 V	9 A	12 A	18 A	26 A	32 A	38 A
	500 V	9.5 A	12.5 A	15 A	23 A	28 A	33 A
	690 V	7 A	9 A	10.5 A	17 A	21 A	24 A
Rated operational power AC-3 (1)							
	220-230-240 V	2.2 kW	3 kW	4 kW	6.5 kW	9 kW	11 kW
	380-400 V	4 kW	5.5 kW	7.5 kW	11 kW	15 kW	18.5 kW
1500 r.p.m. 50 Hz 1800 r.p.m. 60 Hz 3-phase motors	**415 V**	4 kW	5.5 kW	9 kW	11 kW	15 kW	18.5 kW
	440 V	4 kW	5.5 kW	9 kW	15 kW	18.5 kW	22 kW
	500 V	5.5 kW	7.5 kW	9 kW	15 kW	18.5 kW	22 kW
	690 V	5.5 kW	7.5 kW	9 kW	15 kW	18.5 kW	22 kW
Rated making capacity AC-3		10 x Ie AC-3 acc. to IEC 60947-4-1					
Rated breaking capacity AC-3		8 x Ie AC-3 acc. to IEC 60947-4-1					
AC-8a Utilization category							
(without thermal overload relay - Ue 400 V 50/60 Hz - θ ≤ 40 °C)							
Ie / Rated operational current AC-8a		12 A	16 A	22 A	30 A	40 A	50 A
Rated operational power AC-8a		5.5 kW	7.5 kW	11 kW	15 kW	20 kW	25 kW
Short-circuit protection device for contactors							
without thermal overload relay - Motor protection excluded (2)							
Ue ≤ 500 V AC - gG type fuse		25 A	32 A	32 A	50 A	63 A	63 A
Rated short-time withstand current Icw	**1 s**	300 A	300 A	300 A	700 A	700 A	700 A
at 40 °C ambient temperature,	**10 s**	150 A	150 A	150 A	350 A	350 A	350 A
in free air from a cold state	**30 s**	80 A	80 A	80 A	225 A	225 A	225 A
	1 min	60 A	60 A	60 A	150 A	150 A	150 A
	15 min	35 A	35 A	35 A	50 A	50 A	50 A
Maximum breaking capacity							
cos φ = 0.45	**at 440 V**	250 A	250 A	250 A	500 A	500 A	500 A
	at 690 V	106 A	106 A	106 A	200 A	200 A	200 A
Power dissipation per pole	**Ie / AC-1**	0.8 W	1 W	1.2 W	1.8 W	2.4 W	2.4 W
	Ie / AC-3	0.1 W	0.2 W	0.35 W	0.6 W	0.9 W	1.3 W
Max. electrical switching frequency	**AC-1**	600 cycles/h					
	AC-3	1200 cycles/h					
	AC-2, AC-4	300 cycles/h			150 cycles/h		

(1) For the corresponding kW/A or hp/A values of 1500 r.p.m, 50 Hz or 1800 r.p.m, 60 Hz, 3-phase motors, see "Motor rated operational powers and currents".
(2) For the protection of motor starters against short circuits, see "Coordination with short-circuit protection devices".

1SBC101425S0201

A40 … A110, AL, AE, TAL, TAE and AF50 … AF110 3-pole contactors
Technical data

Main pole - Utilization characteristics according to IEC

Contactor types	**AC operated**	A40	A50	A63	A75	A95	A110
	DC operated	AL40	AE50	AE63	AE75	–	–
		TAL40	TAE50	–	TAE75	–	–
	AC / DC operated	–	AF50	AF63	AF75	AF95	AF110
Standards		IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1					
Rated operational voltage Ue max.		690 V	1000 V (690 V for AF.. contactors)			1000 V	
Rated frequency (without derating)		50/60 Hz					
Conventional free-air thermal current Ith							
acc. to IEC 60947-4-1, open contactors, θ ≤ 40 °C		65 A	100 A	125 A	125 A	145 A	160 A
With conductor cross-sectional area		16 mm²	35 mm²	50 mm²	50 mm²	50 mm²	70 mm²
AC-1 Utilization category							
For air temperature close to contactor							
Ie / Rated operational current AC-1	**θ ≤ 40 °C**	60 A	100 A	115 A	125 A	145 A	160 A
Ue max. ≤ 690 V, 50/60 Hz	**θ ≤ 55 °C**	60 A	85 A	95 A	105 A	135 A	145 A
	θ ≤ 70 °C (3)	42 A	70 A	80 A	85 A	115 A	130 A
With conductor cross-sectional area		16 mm²	35 mm²	50 mm²	50 mm²	50 mm²	70 mm²
AC-3 Utilization category							
For air temperature close to contactor θ ≤ 55 °C							
Ie / Max. rated operational current AC-3 (1)							
	220-230-240 V	40 A	53 A	65 A	75 A	96 A	110 A
	380-400 V	37 A	50 A	65 A	75 A	96 A	110 A
3-phase motors	**415 V**	37 A	50 A	65 A	75 A	96 A	110 A
	440 V	37 A	45 A	65 A	70 A	93 A	100 A
	500 V	33 A	45 A	55 A	65 A	80 A	100 A
	690 V	25 A (4)	35 A	43 A	46 A	65 A	82 A
	1000 V	–	23 A (6)	25 A (6)	28 A (6)	30 A	30 A
Rated operational power AC-3 (1)							
	220-230-240 V	11 kW	15 kW	18.5 kW	22 kW	25 kW	30 kW
	380-400 V	18.5 kW	22 kW	30 kW	37 kW	45 kW	55 kW
1500 r.p.m. 50 Hz 1800 r.p.m. 60 Hz 3-phase motors	**415 V**	18.5 kW	25 kW	37 kW	40 kW	55 kW	59 kW
	440 V	22 kW	25 kW	37 kW	40 kW	55 kW	59 kW
	500 V	22 kW	30 kW	37 kW	45 kW	55 kW	59 kW
	690 V	22 kW (4)	30 kW	37 kW	40 kW	55 kW	75 kW
	1000 V	–	30 kW (6)	33 kW (6)	37 kW (6)	40 kW	40 kW
Rated making capacity AC-3		10 x Ie AC-3 acc. to IEC 60947-4-1					
Rated breaking capacity AC-3		8 x Ie AC-3 acc. to IEC 60947-4-1					
AC-8a Utilization category							
(without thermal overload relay - Ue 400 V 50/60 Hz - θ ≤ 40 °C)							
Ie / Rated operational current AC-8a		50 A	63 A	85 A	95 A	120 A	140 A
Rated operational power AC-8a		22 kW	30 kW	45 kW	45 kW	55 kW	75 kW
Short-circuit protection device for contactors							
without thermal overload relay - Motor protection excluded (2)							
Ue ≤ 500 V AC - gG type fuse		63 A	100 A	125 A	160 A	160 A	200 A
Rated short-time withstand current Icw	**1 s**	600 A	1000 A			1320 A	
at 40 °C ambient temperature,	**10 s**	400 A	650 A			800 A	
in free air from a cold state	**30 s**	225 A	370 A			500 A	
	1 min	150 A	250 A			350 A	
	15 min	65 A	110 A	135 A	135 A	160 A	175 A
Maximum breaking capacity							
cos φ = 0.45	**at 440 V**	820 A (5)	1300 A			1160 A	
(cos φ = 0.35 for Ie > 100 A)	**at 690 V**	340 A (5)	630 A			800 A	
Power dissipation per pole	**Ie / AC-1**	3 W	5 W	6.5 W	7 W	6.5 W	7.5 W
	Ie / AC-3	1.3 W	1.3 W	1.5 W	2 W	2.7 W	3.6 W
Max. electrical switching frequency	**AC-1**	600 cycles/h	600 cycles/h (300 for AF.., AE.., TAE..)			300 cycles/h	
	AC-3	1200 cycles/h	600 cycles/h (300 for AF.., AE.., TAE..)			300 cycles/h	
	AC-2, AC-4	300 cycles/h	150 cycles/h				

(1) For the corresponding kW/A or hp/A values of 1500 r.p.m, 50 Hz or 1800 r.p.m, 60 Hz, 3-phase motors, see "Motor rated operational powers and currents".
(2) For the protection of motor starters against short circuits, see "Coordination with short-circuit protection devices".
(3) Unauthorized for TAL.., TAE.. contactors.
(4) AC-3, 690 V values for AL40 and TAL40 contactors: 18.5 kW, Ie = 21 A.
(5) Max. breaking capacity for AL40 and TAL40 contactors: 470 A at 440 V, 175 A at 690 V.
(6) AF contactors excluded.

1SBC101429S0201

A145 … A300 and AF145 … AF300 3-pole contactors
Technical data

Main pole - Utilization characteristics according to IEC

Contactor types						
	AC operated	A145	A185	A210	A260	A300
	AC / DC operated	AF145	AF185	AF210	AF260	AF300
Standards		IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1				
Rated operational voltage Ue max.		1000 V		690 V		
Rated frequency (without derating)		50/60 Hz				
Conventional free-air thermal current Ith						
acc. to IEC 60947-4-1, open contactors, θ ≤ 40 °C		250 A	275 A	350 A	400 A	500 A (4)
With conductor cross-sectional area (3)		120 mm²	150 mm²	185 mm²	240 mm²	300 mm² (4)
AC-1 Utilization category						
For air temperature close to contactor						
Ie / Rated operational current AC-1	**θ ≤ 40 °C**	250 A	275 A	350 A	400 A	500 A (4)
Ue max. ≤ 690 V, 50/60 Hz	**θ ≤ 55 °C**	230 A	250 A	300 A	350 A	400 A (4)
	θ ≤ 70 °C	180 A	180 A	240 A	290 A	325 A (4)
Ie / Rated operational current AC-1	**θ ≤ 40 °C**	180 A	200 A	–	–	–
Ue max. ≤ 1000 V, 50/60 Hz	**θ ≤ 55 °C**	180 A	200 A	–	–	–
	θ ≤ 70 °C	180 A	180 A	–	–	–
With conductor cross-sectional area		120 mm²	150 mm²	185 mm²	240 mm²	300 mm² (4)
AC-3 Utilization category						
For air temperature close to contactor θ ≤ 55 °C						
Ie / Max. rated operational current AC-3 (1)						
	220-230-240 V	145 A	185 A	210 A	260 A	305 A
	380-400 V	145 A	185 A	210 A	260 A	305 A
3-phase motors	**415 V**	145 A	185 A	210 A	260 A	300 A
	440 V	145 A	185 A	210 A	240 A	280 A
	500 V	145 A	170 A	210 A	240 A	280 A
	690 V	120 A	170 A	210 A	220 A	280 A
	1000 V	80 A	95 A	–	–	–
Rated operational power AC-3 (1)						
	220-230-240 V	45 kW	55 kW	59 kW	80 kW	90 kW
	380-400 V	75 kW	90 kW	110 kW	140 kW	160 kW
1500 r.p.m. 50 Hz 1800 r.p.m. 60 Hz 3-phase motors	**415 V**	75 kW	90 kW	110 kW	140 kW	160 kW
	440 V	75 kW	90 kW	110 kW	140 kW	160 kW
	500 V	90 kW	110 kW	132 kW	180 kW	200 kW
	690 V	110 kW	132 kW	160 kW	200 kW	250 kW
	1000 V	110 kW	132 kW	–	–	–
Rated making capacity AC-3		10 x Ie AC-3 acc. to IEC 60947-4-1				
Rated breaking capacity AC-3		8 x Ie AC-3 acc. to IEC 60947-4-1				
Short-circuit protection device for contactors						
without thermal overload relay - Motor protection excluded (2)						
Ue ≤ 500 V AC - gG type fuse		315 A	355 A	400 A	500 A	500 A
Rated short-time withstand current Icw	**1 s**	1800 A	2000 A	2500 A	3500 A	3500 A
at 40 °C ambient temperature,	**10 s**	1200 A	1500 A	1700 A	2400 A	2400 A
in free air from a cold state	**30 s**	800 A	1000 A	1200 A	1500 A	1500 A
	1 min	600 A	800 A	1000 A	1100 A	1100 A
	15 min	280 A	320 A	400 A	500 A	500 A
Maximum breaking capacity						
cos φ = 0.45	**at 440 V**	1500 A	2000 A	2300 A	2600 A	3000 A
(cos φ = 0.35 for Ie > 100 A)	**at 690 V**	1200 A	1600 A	2000 A	2400 A	2500 A
Power dissipation per pole	**Ie / AC-1**	13 W	16 W	18 W	25 W	32 W
	Ie / AC-3	5 W	8 W	9 W	14 W	18 W
Max. electrical switching frequency	**AC-1**	300 cycles/h		300 cycles/h		
	AC-3	300 cycles/h		300 cycles/h		
	AC-2, AC-4	150 cycles/h		150 cycles/h		

(1) For the corresponding kW/A or hp/A values of 1500 r.p.m, 50 Hz or 1800 r.p.m, 60 Hz, 3-phase motors, see "Motor rated operational powers and currents".
(2) For the protection of motor starters against short circuits, see "Coordination with short-circuit protection devices".
(3) Conductors with preparation.
(4) Use terminal extension / enlargement pieces (LX 300 / LW 300).

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AF400 … AF2050 3-pole contactors
Technical data

Main pole - Utilization characteristics according to IEC

Contactor types	AC / DC operated	AF400	AF460	AF580	AF750	AF1250	AF1350	AF1650	AF2050
Standards		IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1							
Rated operational voltage Ue max.		1000 V							
Rated frequency (without derating)		50/60 Hz							
Conventional free-air thermal current Ith									
acc. to IEC 60947-4-1, open contactors, θ ≤ 40 °C		600 A	700 A	800 A	1050 A	1260 A	1350 A	1650 A	2050 A
With conductor cross-sectional area (3)		2x185 mm²	2x240 mm²	2x240 mm²	800 mm² (4)	1000 mm² (4)	1000 mm² (5)	1500 mm² (5)	2000 mm² (5)
AC-1 Utilization category									
For air temperature close to contactor									
Ie / Rated operational current AC-1	**θ ≤ 40 °C**	600 A	700 A	800 A	1050 A	1260 A	1350 A	1650 A	2050 A
Ue max. ≤ 690 V, 50/60 Hz	**θ ≤ 55 °C**	500 A	600 A	700 A	875 A	1040 A	1150 A	1450 A	1750 A
	θ ≤ 70 °C	400 A	480 A	580 A	720 A	875 A	1000 A	1270 A	1500 A
Ie / Rated operational current AC-1	**θ ≤ 40 °C**	600 A	700 A	800 A	1000 A	1260 A	1350 A	1650 A	2050 A
Ue max. ≤ 1000 V, 50/60 Hz	**θ ≤ 55 °C**	500 A	600 A	700 A	875 A	1040 A	1150 A	1450 A	1750 A
	θ ≤ 70 °C	400 A	480 A	580 A	720 A	875 A	1000 A	1270 A	1500 A
With conductor cross-sectional area		2x185 mm²	2x240 mm²	2x240 mm²	800 mm² (4)	1000 mm² (4)	1000 mm² (5)	1500 mm² (5)	2000 mm² (5)
AC-3 Utilization category									
For air temperature close to contactor θ ≤ 55 °C									
Ie / Max. rated operational current AC-3 (1)									
	220-230-240 V	400 A	460 A	580 A	750 A	–	860 A	1050 A	–
	380-400 V	400 A	460 A	580 A	750 A	–	860 A	1050 A	–
3-phase motors	**415 V**	400 A	460 A	580 A	750 A	–	860 A	1050 A	–
	440 V	400 A	460 A	580 A	750 A	–	860 A	1050 A	–
	500 V	400 A	460 A	580 A	750 A	–	800 A	950 A	–
	690 V	350 A	400 A	500 A	650 A	–	800 A	950 A	–
	1000 V	155 A	200 A	250 A	300 A	–	–	–	–
Rated operational power AC-3 (1)									
	220-230-240 V	110 kW	132 kW	160 kW	220 kW	–	257 kW	315 kW	–
	380-400 V	200 kW	250 kW	315 kW	400 kW	–	475 kW	560 kW	–
1500 r.p.m. 50 Hz 1800 r.p.m. 60 Hz 3-phase motors	**415 V**	220 kW	250 kW	355 kW	425 kW	–	500 kW	600 kW	–
	440 V	220 kW	250 kW	355 kW	450 kW	–	560 kW	670 kW	–
	500 V	250 kW	315 kW	400 kW	520 kW	–	560 kW	700 kW	–
	690 V	315 kW	355 kW	500 kW	600 kW	–	750 kW	900 kW	–
	1000 V	220 kW	280 kW	355 kW	400 kW	–	–	–	–
Rated making capacity AC-3		10 x Ie AC-3 acc. to IEC 60947-4-1							
Rated breaking capacity AC-3		8 x Ie AC-3 acc. to IEC 60947-4-1							
Short-circuit protection device for contactors									
without thermal overload relay - Motor protection excluded (2)									
Ue ≤ 500 V AC - gG type fuse		630 A	800 A	1000 A	1000 A	Please consult us for coordination with circuit-breaker			
Rated short-time withstand current Icw	**1 s**	4600 A	4600 A	7000 A	7000 A	8000 A	10000 A	12000 A	12000 A
at 40 °C ambient temperature,	**10 s**	4400 A	4400 A	6400 A	6400 A	7200 A	8000 A	10000 A	10000 A
in free air from a cold state	**30 s**	3100 A	3100 A	4500 A	4500 A	5200 A	6000 A	7500 A	7500 A
	1 min	2500 A	2500 A	3500 A	3500 A	4000 A	4500 A	5500 A	5500 A
	15 min	840 A	840 A	1300 A	1300 A	1500 A	1600 A	2200 A	2200 A
Maximum breaking capacity									
cos φ = 0.45	**at 440 V**	4000 A	5000 A	6000 A	7500 A		10000 A	12000 A	8400 A
(cos φ = 0.35 for Ie > 100 A)	**at 690 V**	3500 A	4500 A	5000 A	7000 A		–	–	–
Power dissipation per pole	**Ie / AC-1**	30 W	42 W	32 W	50 W	80 W	80 W	80 W	125 W
	Ie / AC-3	16 W	21 W	17 W	28 W	–	50 W	50 W	–
Max. electrical switching frequency	**AC-1**	300 cycles/h		300 cycles/h		300 cycles/h	60 cycles/h		60 cycles/h
	AC-3	300 cycles/h		300 cycles/h		–	60 cycles/h		–
	AC-2, AC-4	60 cycles/h		60 cycles/h		–	60 cycles/h		–

(1) For the corresponding kW/A or hp/A values of 1500 r.p.m, 50 Hz or 1800 r.p.m, 60 Hz, 3-phase motors, see "Motor rated operational powers and currents".
(2) For the protection of motor starters against short circuits, see "Coordination with short-circuit protection devices".
(3) Conductors with preparation.
(4) Max. connection bar width 50 mm.
(5) Max. connection bar width 100 mm.

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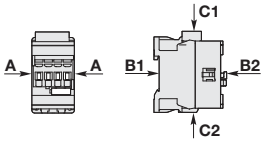
AF09 ... AF38 3-pole contactors
Technical data

Main pole - Utilization characteristics according to UL / NEMA / CSA

Contactor types	AC / DC operated	AF09	AF12	AF16	AF26	AF30	AF38
Standards		UL 508, CSA C22.2 N°14					
Max. operational voltage		600 V					
NEMA size		00	0	–	1	–	–
NEMA continuous amp rating	Thermal current	9 A	18 A		27 A		
NEMA maximum horse power ratings 1-phase, 60 Hz							
	115 V AC	1/3 hp	1 hp		2 hp		
	230 V AC	1 hp	2 hp		3 hp		
NEMA maximum horse power ratings 3-phase, 60 Hz							
	200 V AC	1-1/2 hp	3 hp		7-1/2 hp		
	230 V AC	1-1/2 hp	3 hp		7-1/2 hp		
	460 V AC	2 hp	5 hp		10 hp		
	575 V AC	2 hp	5 hp		10 hp		
UL / CSA general use rating							
600 V AC		25 A	28 A	30 A	45 A	50 A	50 A
With conductor cross-sectional area		AWG 10	AWG 10	AWG 10	AWG 8	AWG 8	AWG 8
UL / CSA maximum 1-phase motor rating							
Full load current	**120 V AC**	13.8 A	16 A	20 A	24 A	24 A	24 A
	240 V AC	10 A	12 A	17 A	17 A	28 A	28 A
Horse power rating	**120 V AC**	3/4 hp	1 hp	1-1/2 hp	2 hp	2 hp	2 hp
	240 V AC	1-1/2 hp	2 hp	3 hp	3 hp	5 hp	5 hp
UL / CSA maximum 3-phase motor rating							
Full load current (1)	**200-208 V AC**	7.8 A	11 A	17.5 A	25.3 A	32.2 A	32.2 A
	220-240 V AC	6.8 A	9.6 A	15.2 A	22 A	28 A	28 A
	440-480 V AC	7.6 A	11 A	14 A	21 A	27 A	27 A
	550-600 V AC	9 A	11 A	17 A	22 A	27 A (2)	27 A (2)
Horse power rating (1)	**200-208 V AC**	2 hp	3 hp	5 hp	7-1/2 hp	10 hp	10 hp
	220-240 V AC	2 hp	3 hp	5 hp	7-1/2 hp	10 hp	10 hp
	440-480 V AC	5 hp	7-1/2 hp	10 hp	15 hp	20 hp	20 hp
	550-600 V AC	7-1/2 hp	10 hp	15 hp	20 hp	25 hp (2)	25 hp (2)
Short-circuit protection device for contactors without thermal overload relay - Motor protection excluded							
Fuse rating		60 A	60 A	60 A	150 A	150 A	150 A
Fuse type, 600 V		NTD					
Max. electrical switching frequency							
For general use		600 cycles/h					
For motor use		1200 cycles/h					

(1) For the corresponding kW/A or hp/A values of 1500 r.p.m, 50 Hz or 1800 r.p.m, 60 Hz, 3-phase motors, see “Motor rated operational powers and currents”.
(2) For contactors produced since week 49-2011.

General technical data

Contactor types	AC / DC operated	AF09	AF12	AF16	AF26	AF30	AF38
Rated insulation voltage Ui							
acc. to IEC 60947-4-1		690 V					
acc. to UL / CSA		600 V					
Rated impulse withstand voltage Uimp.		6 kV					
Electromagnetic compatibility		Devices complying with IEC 60947-1 / EN 60947-1 - Environment A					
Ambient air temperature close to contactor							
Operation Fitted with thermal overload relay		-25...+60 °C					
Operation Without thermal overload relay		-40...+70 °C					
Storage		-60...+80 °C					
Climatic withstand		Category B according to IEC 60947-1 Annex Q					
Maximum operating altitude (without derating)		3000 m					
Mechanical durability							
Number of operating cycles		10 millions operating cycles					
Max. switching frequency		3600 cycles/h					
Shock withstand acc. to IEC 60068-2-27 and EN 60068-2-27 Mounting position 1							
	**Shock direction**	1/2 sinusoidal shock for 11 ms: no change in contact position, closed or open position					
	A	30 g					
	B1	25 g closed position / 5 g open position					
	B2	15 g					
	C1	25 g					
	C2	25 g					
Vibration withstand acc. to IEC 60068-2-6		5...300 Hz 4 g closed position / 2 g open position					

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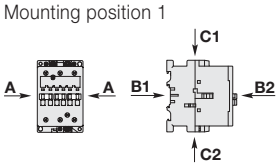
A40 … A110, AL, AE, TAL, TAE and AF50 … AF110 3-pole contactors
Technical data

Main pole - Utilization characteristics according to UL / NEMA / CSA

Contactor types		AC operated	A40	A50	A63	A75	A95	A110
		DC operated	AL40, TAL40	AE50, TAE50	AE63	AE75, TAE75	–	–
		AC / DC operated	–	AF50	AF63	AF75	AF95	AF110
Standards			UL 508, CSA C22.2 N°14					
Max. operational voltage			600 V					
NEMA size			–	2	–	3	–	–
NEMA continuous amp rating		Thermal current	–	45 A	–	90 A	–	–
NEMA maximum horse power ratings 1-phase, 60 Hz								
		115 V AC	–	3 hp	–	–	–	–
		230 V AC	–	7-1/2	–	–	–	–
NEMA maximum horse power ratings 3-phase, 60 Hz								
		200 V AC	–	10 hp	–	25 hp	–	–
		230 V AC	–	15 hp	–	30 hp	–	–
		460 V AC	–	25 hp	–	50 hp	–	–
		575 V AC	–	25 hp	–	50 hp	–	–
UL / CSA general use rating								
600 V AC			60 A	80 A	90 A	105 A	125 A	150 A
With conductor cross-sectional area			AWG 6	AWG 4	AWG 3	AWG 2	AWG 1	AWG 1/0
UL / CSA maximum 1-phase motor rating								
Full load current		**120 V AC**	34 A	34 A	56 A	80 A	80 A	100 A
		240 V AC	40 A	40 A	50 A	68 A	88 A	110 A
Horse power rating		**120 V AC**	3 hp	3 hp	5 hp	7.5 hp	7.5 hp	10 hp
		240 V AC	7.5 hp	7.5 hp	10 hp	15 hp	20 hp	25 hp
UL / CSA maximum 3-phase motor rating								
Full load current (1)		**200-208 V AC**	32.2 A	48.3 A	62.1 A	78.2 A	92 A	92 A
		220-240 V AC	42 A	54 A	68 A	80 A	80 A	104 A
		440-480 V AC	40 A	52 A	77 A	77 A	77 A	96 A
		550-600 V AC	41 A	52 A	77 A	77 A	77 A	99 A
Horse power rating (1)		**200-208 V AC**	10 hp	15 hp	20 hp	25 hp	30 hp	30 hp
		220-240 V AC	15 hp	20 hp	25 hp	30 hp	30 hp	40 hp
		440-480 V AC	30 hp	40 hp	60 hp	60 hp	60 hp	75 hp
		550-600 V AC	40 hp	50 hp	75 hp	75 hp	75 hp	100 hp
Short-circuit protection device for contactors without thermal overload relay - Motor protection excluded								
Fuse rating			150 A	175 A	200 A	200 A	200 A	200 A
Fuse type, 600 V			FRS-R		J			
Max. electrical switching frequency								
For general use			600 cycles/h	600 cycles/h (300 for AF.., AE..)			300 cycles/h	
For motor use			1200 cycles/h	600 cycles/h (300 for AF.., AE..)			300 cycles/h	

(1) For the corresponding kW/A or hp/A values of 1500 r.p.m, 50 Hz or 1800 r.p.m, 60 Hz, 3-phase motors, see “Motor rated operational powers and currents”.

General technical data

Contactor types		AC operated	A40	A50	A63	A75	A95	A110
		DC operated	AL40, TAL40	AE50, TAE50	AE63	AE75, TAE75	–	–
		AC / DC operated	–	AF50	AF63	AF75	AF95	AF110
Rated insulation voltage Ui								
acc. to IEC 60947-4-1			1000 V					
acc. to UL			600 V					
Rated impulse withstand voltage Uimp.			8 kV					
Electromagnetic compatibility			AF contactors complying with IEC 60947-1 / EN 60947-1 - Environment A					
Ambient air temperature close to contactor								
Operation	Fitted with thermal overload relay		-25…+55 °C					
	Without thermal overload relay		-40…+70 °C (55 °C max. for TAL.., and TAE.. contactor)					
Storage			-60…+80 °C				-40…+70 °C	
Climatic withstand			acc. to IEC 60068-2-30 and 60068-2-11 UTE C 63-100 specification II				acc. to IEC 60068-2-30	
Maximum operating altitude (without derating)			3000 m					
Mechanical durability								
Number of operating cycles			10 millions operating cycles (5 millions for AE.. and TAE..)					
Max. switching frequency			3600 cycles/h (300 for AF contactors)					
Shock withstand acc. to IEC 60068-2-27 and EN 60068-2-27								
Mounting position 1		**Shock direction**	1/2 sinusoidal shock for 11 ms: no change in contact position, closed or open position (2)					
		**A**	20 g					
		B1	10 g closed position / 5 g open position					
		B2	15 g					
		C1	20 g					
		C2	20 g					

For AL40, TAL40
A : 20 g closed position / 10 g open position
B1 : 15 g closed position / 5 g open position
B2 : 10 g closed position / 10 g open position
C1 : 20 g closed position / 8 g open position
C2 : 14 g closed position / 8 g open position

(2) These values are not valid for rail mounting with contactors A95 ... A110 and AF95 ... AF110.

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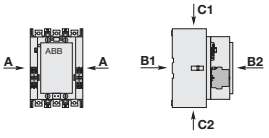
A145 … A300 and AF145 … AF300 3-pole contactors
Technical data

Main pole - Utilization characteristics according to UL / NEMA / CSA

Contactor types		AC operated	A145	A185	A210	A260	A300
		AC / DC operated	AF145	AF185	AF210	AF260	AF300
Standards			UL 508, CSA C22.2 N°14				
Max. operational voltage			600 V				
NEMA size			4	–	–	5	–
NEMA maximum horse power ratings 1-phase, 60 Hz							
		115 V AC	–	–	–	–	–
		230 V AC	–	–	–	–	–
NEMA maximum horse power ratings 3-phase, 60 Hz							
		200 V AC	40 hp			75 hp	
		230 V AC	50 hp			100 hp	
		460 V AC	100 hp			200 hp	
		575 V AC	200 hp			200 hp	
UL / CSA general use rating							
600 V AC			230 A	250 A	300 A	350 A	400 A
UL / CSA maximum 1-phase motor rating							
Full load current		**240 V AC**	–	–	–	–	–
Horse power rating		**240 V AC**	–	–	–	–	–
UL / CSA maximum 3-phase motor rating							
Full load current (1)		**200-208 V AC**	119.6 A	149.5 A	166.8 A	220.8 A	285.2 A
		220-240 V AC	130 A	145 A	192 A	248 A	248 A
		440-480 V AC	124 A	156 A	180 A	240 A	302 A
		550-600 V AC	125 A	144 A	192 A	242 A	289 A
Horse power rating (1)		**200-208 V AC**	40 hp	50 hp	60 hp	75 hp	100 hp
		220-240 V AC	50 hp	60 hp	75 hp	100 hp	100 hp
		440-480 V AC	100 hp	125 hp	150 hp	200 hp	250 hp
		550-600 V AC	125 hp	150 hp	200 hp	250 hp	300 hp
Short-circuit protection device for contactors							
without thermal overload relay - Motor protection excluded							
Fuse rating			300 A	400 A	800 A	800 A	800 A
Fuse type, 600 V			J/K5				
Max. electrical switching frequency							
For general use			300 cycles/h				
For motor use			300 cycles/h				

(1) For the corresponding kW/A or hp/A values of 1500 r.p.m, 50 Hz or 1800 r.p.m, 60 Hz, 3-phase motors, see “Motor rated operational powers and currents”.

General technical data

Contactor types		AC operated	A145	A185	A210	A260	A300
		AC / DC operated	AF145	AF185	AF210	AF260	AF300
Rated insulation voltage Ui							
acc. to IEC 60947-4-1			1000 V				
acc. to UL			600 V				
Rated impulse withstand voltage Uimp.			8 kV				
Electromagnetic compatibility			AF contactors complying with IEC 60947-1 / EN 60947-1 - Environment A				
Ambient air temperature close to contactor							
Operation	Fitted with thermal overload relay		-25 to +55 °C				
	Fitted with electronic overload relay		-25 to +70 °C				
	Without electronic overload relay		-40 to +70 °C				
Storage			-40 to +70 °C				
Climatic withstand			acc. to IEC 60068-2-30				
Maximum operating altitude (without derating)			3000 m				
Mechanical durability							
Number of operating cycles			5 millions operating cycles				
Max. switching frequency			3600 cycles/h (300 for AF… contactors)				
Shock withstand							
acc. to IEC 60068-2-27 and EN 60068-2-27							
Mounting position 1							
		Shock direction	1/2 sinusoidal shock for 30 ms: no change in contact position, closed or open position				
		**A**	5 g				
		B1	5 g				
		B2	5 g				
		C1	5 g				
		C2	5 g				

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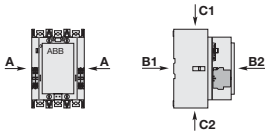
AF400 ... AF2050 3-pole contactors
Technical data

Main pole - Utilization characteristics according to UL / NEMA / CSA

Contactor types	AC / DC operated	AF400	AF460	AF580	AF750	AF1250	AF1350	AF1650	AF2050
Standards		UL 508, CSA C22.2 N°14							
Max. operational voltage		600 V							
NEMA size		–	6	–	7		–	8	–
NEMA maximum horse power ratings 1-phase, 60 Hz									
	115 V AC	–							
	230 V AC	–							
NEMA maximum horse power ratings 3-phase, 60 Hz									
	200 V AC	–	150 hp	–	–		–	–	–
	230 V AC	–	200 hp	–	300 hp		–	450 hp	–
	460 V AC	–	400 hp	–	600 hp		–	900 hp	–
	575 V AC	–	400 hp	–	600 hp		–	900 hp	–
UL / CSA general use rating									
600 V AC		550 A	650 A	750 A	900 A	1210 A	1350 A	1650 A	2100 A
UL / CSA maximum 1-phase motor rating									
Full load current	**120 V AC**	–	–	–	–	–	–	–	–
	240 V AC	–	–	–	–	–	–	–	–
Horse power rating	**120 V AC**	–	–	–	–	–	–	–	–
	240 V AC	–	–	–	–	–	–	–	–
UL / CSA maximum 3-phase motor rating									
Full load current (1)	**200-208 V AC**	358.8 A	414 A	552 A	692.3 A	–	954 A	1030 A	–
	220-240 V AC	360 A	480 A	604 A	722 A	–	954 A	1030 A	–
	440-480 V AC	414 A	477 A	590 A	722 A	–	954 A	1030 A	–
	550-600 V AC	382 A	472 A	578 A	672 A	–	944 A	1050 A	–
Horse power rating (1)	**200-208 V AC**	125 hp	150 hp	200 hp	250 hp	–	–	–	–
	220-240 V AC	150 hp	200 hp	250 hp	300 hp	–	400 A	450 hp	–
	440-480 V AC	350 hp	400 hp	500 hp	600 hp	–	800 A	900 hp	–
	550-600 V AC	400 hp	500 hp	600 hp	700 hp	–	1000 A	1150 hp	–
Short-circuit protection device for contactors without thermal overload relay - Motor protection excluded									
Fuse rating		1000 A		1200 A			Please consult us for coordination with circuit-breaker		
Fuse type, 600 V		L							
Max. electrical switching frequency									
For general use		300 cycles/h					60 cycles/h		
For motor use		300 cycles/h					60 cycles/h		

(1) For the corresponding kW/A or hp/A values of 1500 r.p.m, 50 Hz or 1800 r.p.m, 60 Hz, 3-phase motors, see “Motor rated operational powers and currents”.

General technical data

Contactor types	AC / DC operated	AF400	AF460	AF580	AF750	AF1250	AF1350	AF1650	AF2050
Rated insulation voltage Ui									
acc. to IEC 60947-4-1		1000 V							
acc. to UL		600 V							
Rated impulse withstand voltage Uimp.		8 kV							
Electromagnetic compatibility		AF contactors complying with IEC 60947-1 / EN 60947-1 - Environment A							
Ambient air temperature close to contactor									
Operation Fitted with electronic overload relay		-25 to +70 °C							
Operation Without electronic overload relay		-40 to +70 °C							
Storage		-40 to +70 °C							
Climatic withstand		acc. to IEC 60068-2-30							
Maximum operating altitude (without derating)		3000 m							
Mechanical durability									
Number of operating cycles		3 millions operating cycles				0.5 million operating cycles			
Max. switching frequency		300 cycles/h					60 cycles/h		
Shock withstand acc. to IEC 60068-2-27 and EN 60068-2-27									
Mounting position 1	**Shock direction**	1/2 sinusoidal shock for 30 ms: no change in contact position, closed or open position							
	**A**	5 g					–		
	B1	5 g					–		
	B2	5 g					–		
	C1	5 g					–		
	C2	5 g					–		

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AF09 ... AF38 3-pole contactors
Technical data

Magnet system characteristics

Contactor types		AC / DC operated	AF09	AF12	AF16	AF26	AF30	AF38
Coil operating limits acc. to IEC 60947-4-1		**AC supply**	At θ ≤ 60 °C 0.85 x Uc min...1.1 x Uc max. At θ ≤ 70 °C 0.85 x Uc min...Uc max.					
		DC supply	At θ ≤ 60 °C 0.85 x Uc min...1.1 x Uc max. At θ ≤ 70 °C (AF) 0.85 x Uc min...Uc max. - (AF..Z) 0.85 x Uc min...1.1 x Uc max.					
AC control voltage 50/60 Hz	Rated control circuit voltage Uc		24...500 V AC					
	Coil consumption	**Average pull-in value**	(AF) 50 VA - (AF..Z) 16 VA					
		Average holding value	(AF) 2.2 VA / 2 W - (AF..Z) 1.7 VA / 1.5 W					
DC control voltage	Rated control circuit voltage Uc		12...500 V DC					
	Coil consumption	**Average pull-in value**	(AF) 50 W - (AF..Z) 12...16 W					
		Average holding value	(AF) 2 W - (AF..Z) 1.7 W					
PLC-output control			(AF..Z) ≥ 500 mA 24 V DC					
Drop-out voltage			≤ 60 % of Uc min.					
Voltage sag immunity acc. to SEMI F47-0706			(AF..Z) conditions of use on request					
Dips withstand -20 °C ≤ θ ≤ +60 °C			(AF..Z) 22 ms average					
Operating time								
Between coil energization and:		**N.O. contact closing**	40...95 ms					
		N.C. contact opening	38...90 ms					
Between coil de-energization and:		**N.O. contact opening**	11...95 ms					
		N.C. contact closing	13...98 ms					

Mounting characteristics and conditions for use

Contactor types		AC / DC operated	AF09	AF12	AF16	AF26	AF30	AF38
Mounting positions								
			Max. N.C. built-in and add-on N.C. auxiliary contacts: see accessory fitting details for a 3-pole contactor AF09 ... AF38					
Mounting distances			The contactors can be assembled side by side					
Fixing	On rail according to IEC 60715, EN 60715		35 x 7.5 mm or 35 x 15 mm					
	By screws (not supplied)		2 x M4 screws placed diagonally					

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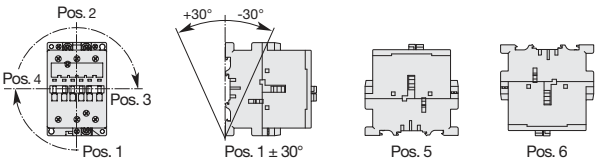
A40 … A110 3-pole contactors
Technical data

Magnet system characteristics

Contactor types			AC operated	A40	A50	A63	A75	A95	A110
Coil operating limits			**AC supply**	At θ ≤ 55 °C 0.85...1.1 x Uc				at θ ≤ 70 °C 0.85...1.1 x Uc	
acc. to IEC 60947-4-1				Please also refer to "Mounting characteristics and conditions for use"					
AC control voltage	Rated control circuit voltage Uc		**at 50 Hz**	24…690 V					
			at 60 Hz	24…690 V					
	Coil consumption	**Average pull-in value**	**50 Hz**	120 VA	180 VA			350 VA	
			60 Hz	140 VA	210 VA			450 VA	
			50/60 Hz (1)	125 VA / 120 VA	190 VA / 180 VA			410 VA / 365 VA	
		Average holding value	**50 Hz**	12 VA / 3 W	18 VA / 5.5 W			22 VA / 6.5 W	
			60 Hz	12 VA / 3 W	18 VA / 5.5 W			26 VA / 8 W	
			50/60 Hz (1)	12 VA / 3 W	18 VA / 5.5 W			27 VA / 7.5 W	
Drop-out voltage				Approx. 40...65 % of Uc					
Operating time									
	Between coil energization and:		**N.O. contact closing**	8…21 ms	8…27 ms			10…25 ms	
			N.C. contact opening	6…18 ms	7…22 ms			7…22 ms	
	Between coil de-energization and:		**N.O. contact opening**	4…11 ms	4…11 ms			7…15 ms	
			N.C. contact closing	7…14 ms	7…14 ms			10…18 ms	

(1) 50/60 Hz coils: see "Voltage code table".

Mounting characteristics and conditions for use

Contactor types			AC operated	A40	A50	A63	A75	A95	A110
Mounting positions								
				Max. built-in and add-on N.O. or N.C. auxiliary contacts: see accessory fitting details for 3-pole contactor A40 ... A110					
Control voltage / Ambient temperature									
	Mounting positions	1, 1±30°, 2, 3, 4, 5	**at θ ≤ 55 °C**	0.85...1.1 x Uc				0.85...1.1 x Uc	
			at θ ≤ 70 °C	Uc				0.85...1.1 x Uc	
		6	**at θ ≤ 55 °C**	0.95...1.1 x Uc				Unauthorized	
			at θ ≤ 70 °C	Unauthorized				Unauthorized	
Mounting distances				The contactors can be assembled side by side					
Fixing	On rail according to IEC 60715, EN 60715			35 x 7.5 mm or 35 x 15 mm	35 x 15 mm or 75 x 25 mm			–	
	By screws (not supplied)			2 x M4 screws placed diagonally	2 x M6 screws placed diagonally			2 x M6 screws placed diagonally	

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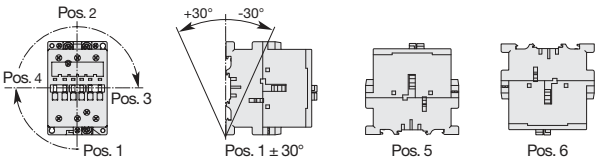
AL40 and AE50 … AE75 3-pole contactors
Technical data

Magnet system characteristics

Contactor types		DC operated	AL40	AE50	AE63	AE75
Coil operating limits acc. to IEC 60947-4-1		**DC supply**	at θ ≤ 55 °C 0.85...1.1 x Uc Please also refer to "Mounting characteristics and conditions for use"			
DC control voltage	Rated control circuit voltage Uc		12...250 V DC			
	Coil consumption	**Average pull-in value**	3.5 W	200 W		
		Average holding value	3.5 W	4 W		
Drop-out voltage			approx. 10...30 % of Uc	approx. 15...40 % of Uc		
Coil time constant	Open	**L/R**	38 ms	3 ms		
	Closed	**L/R**	62 ms	15 ms		
Operating time						
Between coil energization and:		**N.O. contact closing**	55…110 ms	13…30 ms		
		N.C. contact opening	25…75 ms	10…27 ms		
Between coil de-energization and:		**N.O. contact opening** (1)	12…18 ms	5…15 ms		
		N.C. contact closing (1)	18…28 ms	8…18 ms		

(1) The use of surge suppressors increases the opening time with a factor of 1.1 to 1.5 for a RV5 surge suppressor and a factor of 1.5 to 3 for a RT5 surge suppressor.

Mounting characteristics and conditions for use

Contactor types			DC operated	AL40	AE50	AE63	AE75
Mounting positions							
				Max. built-in and add-on N.O. or N.C. auxiliary contacts: see accessory fitting details for 3-pole contactor AL40, AE50 … AE75			
Control voltage / Ambient temperature							
Mounting positions	1, 1±30°, 2, 3, 4, 5		**at θ ≤ 55 °C**	0.85 x Uc…1.1 x Uc			
			at θ ≤ 70 °C	Uc			
	6		**at θ ≤ 55 °C**	Unauthorized	0.95 x Uc...1.1 x Uc		
			at θ ≤ 70 °C	Unauthorized			
Mounting distances				The contactors can be assembled side by side			
Fixing	On rail according to IEC 60715, EN 60715			35 x 7.5 mm or 35 x 15 mm	35 x 15 mm or 75 x 25 mm		
	By screws (not supplied)			2 x M4 screws placed diagonally	2 x M6 screws placed diagonally		

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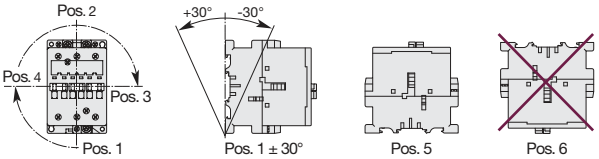
AF50 … AF110 3-pole contactors
Technical data

Magnet system characteristics

Contactor types		AC / DC operated	AF50	AF63	AF75	AF95	AF110
Coil operating limits acc. to IEC 60947-4-1		**AC or DC supply**	At θ ≤ 70 °C 0.85 x Uc min...1.1 x Uc max. Please also refer to "Mounting characteristics and conditions for use"				
AC control voltage	Rated control circuit voltage Uc		48…250 V 50/60 Hz				
50/60 Hz	Coil consumption	**Average pull-in value**	210 VA			350 VA	
		Average holding value	7 VA / 2.8 W			7 VA / 3.5 W	
DC control voltage	Rated control circuit voltage Uc		20…250 V DC				
	Coil consumption	**Average pull-in value**	190 W			400 W	
		Average holding value	2.8 W			2 W	
Drop-out voltage			55 % of Uc min.				
Voltage sag immunity acc. to SEMI F47			Conditions of use on request				
Dips withstand			≥ 20 ms				
Operating time							
Between coil energization and:		**N.O. contact closing**	30…100 ms			30…80 ms	
		N.C. contact opening	27…95 ms			27…77 ms	
Between coil de-energization and:		**N.O. contact opening**	30…110 ms			55…125 ms	
		N.C. contact closing	35…115 ms			60…130 ms	

Mounting characteristics and conditions for use

Contactor types		AC / DC operated	AF50	AF63	AF75	AF95	AF110
Mounting positions							
			Max. built-in and add-on N.O. or N.C. auxiliary contacts: see accessory fitting details for 3-pole contactor AF50 ... AF110				
Control voltage / Ambient temperature							
Mounting positions	1, 1±30°, 2, 3, 4, 5	**at θ ≤ 70 °C**	0.85 x Uc min…1.1 x Uc max.				
	6		Unauthorized				
Mounting distances			The contactors can be assembled side by side				
Fixing	On rail according to IEC 60715, EN 60715		35 x 15 mm or 75 x 25 mm			–	
	By screws (not supplied)		2 x M6 screws placed diagonally				

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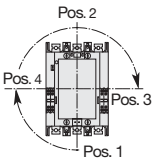
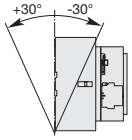
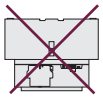
A145 … A300 3-pole contactors
Technical data

Magnet system characteristics

Contactor types			AC operated	A145	A185	A210	A260	A300
Coil operating limits acc. to IEC 60947-4-1			**AC supply**	At θ ≤ 70 °C 0.85...1.1 x Uc Please also refer to "Mounting characteristics and conditions for use"				
AC control voltage	Rated control circuit voltage Uc		**at 50 Hz**	24…690 V				
			at 60 Hz	24…690 V				
	Coil consumption	**Average pull-in value**	**50 Hz**	550 VA		1350 VA		
			60 Hz	600 VA		1550 VA		
			50/60 Hz (1)	700 VA / 650 VA		1700 VA / 1550 VA		
		Average holding value	**50 Hz**	35 VA / 11 W		60 VA / 16 W		
			60 Hz	40 VA / 12 W		65 VA / 19 W		
			50/60 Hz (1)	44 VA / 13 W		80 VA / 21 W		
Drop-out voltage				Approx. 40…65 % of Uc min.				
Operating time								
Between coil energization and:			**N.O. contact closing**	13…27 ms		17…35 ms		
			N.C. contact opening	8…22 ms		12…30 ms		
Between coil de-energization and:			**N.O. contact opening**	5…10 ms		7…13 ms		
			N.C. contact closing	9…13 ms		10…16 ms		

(1) 50/60 Hz coils: see "Voltage code table".

Mounting characteristics and conditions for use

Contactor types			AC operated	A145	A185	A210	A260	A300
Mounting positions								
				Max. add-on N.O. or N.C. auxiliary contacts: see accessory fitting details for 3-pole contactor A145 … A300				
Control voltage / Ambient temperature								
	Mounting positions	1, 1±30°, 2, 3, 4, 5	**at θ ≤ 70 °C**	0.85 x Uc…1.1 x Uc				
		6		Unauthorized				
Mounting distances				The contactors can be assembled side by side				
Fixing	On rail according to IEC 60715, EN 60715			–				
	By screws (not supplied)			4 x M5				

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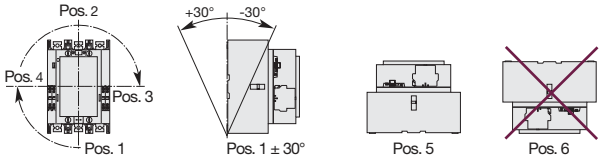
AF145 … AF300 3-pole contactors
Technical data

Magnet system characteristics

Contactor types		AC / DC operated	AF145	AF185	AF210	AF260	AF300
Coil operating limits acc. to IEC 60947-4-1		**AC or DC supply**	At θ ≤ 70 °C 0.85 x Uc min...1.1 x Uc max. Please also refer to "Mounting characteristics and conditions for use"				
AC control voltage	Rated control circuit voltage Uc		48…250 V AC				
50/60 Hz	Coil consumption	**Average pull-in value**	430 VA		470 VA		
		Average holding value	12 VA / 3.5 W		10 VA / 2.5 W		
DC control voltage	Rated control circuit voltage Uc		20…250 V DC				
	Coil consumption	**Average pull-in value**	500 W		520 W		
		Average holding value	2 W		2 W		
Drop-out voltage			55 % of Uc min.				
Voltage sag immunity acc. to SEMI F47			Conditions of use on request				
Dips withstand			≥ 20 ms				
Operating time							
Between coil energization and:		**N.O. contact closing**	30…115 ms				
		N.C. contact opening	30…115 ms				
Between coil de-energization and:		**N.O. contact opening**	25…80 ms				
		N.C. contact closing	25…80 ms				

Mounting characteristics and conditions for use

Contactor types		AC / DC operated	AF145	AF185	AF210	AF260	AF300
Mounting positions							
			Max. add-on N.O. or N.C. auxiliary contacts: see accessory fitting details for 3-pole contactor AF145 ... AF2050				
Control voltage / Ambient temperature							
Mounting positions	1, 1±30°, 2, 3, 4, 5	**at θ ≤ 70 °C**	0.85 x Uc min…1.1 x Uc max.				
	6		Unauthorized				
Mounting distances			The contactors can be assembled side by side				
Fixing	On rail according to IEC 60715, EN 60715		–				
	By screws (not supplied)		4 x M5				

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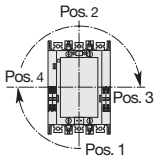
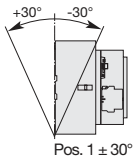
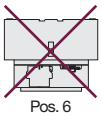
AF400 ... AF2050 3-pole contactors
Technical data

Magnet system characteristics

Contactor types		AC / DC operated	AF400	AF460	AF580	AF750	AF1250	AF1350	AF1650	AF2050
Coil operating limits acc. to IEC 60947-4-1		**AC or DC supply**	At θ ≤ 70 °C 0.85 x Uc min...1.1 x Uc max. Please also refer to "Mounting characteristics and conditions for use"							
AC control voltage 50/60 Hz	Rated control circuit voltage Uc		48…500 V AC					100…250 V		
	Coil consumption	**Average pull-in value**	890 VA		850 VA			1900 VA		
		Average holding value	12 VA / 4 W		12 VA / 4.5 W			48 VA / 17 W		
DC control voltage	Rated control circuit voltage Uc		24…500 V DC					100…250 V		
	Coil consumption	**Average pull-in value**	990 W		950 W			1700 W		
		Average holding value	4 W		4.5 W			16 W		
Drop-out voltage			55 % of Uc min.							
Voltage sag immunity acc. to SEMI F47			Conditions of use on request							
Dips withstand			≥ 20 ms							
Operating time										
Coil supply between A1 - A2										
Between coil energization and:		**N.O. contact closing**	50…120 ms					50…80 ms		
		N.C. contact opening	50…120 ms					50…80 ms		
Between coil de-energization and:		**N.O. contact opening**	33…70 ms					35…55 ms		
		N.C. contact closing	33…70 ms					35…55 ms		
Control input for PLC's										
Between coil energization and:		**N.O. contact closing**	40…60 ms		40...90 ms			40…65 ms		
		N.C. contact opening	40…60 ms		40...90 ms			40…65 ms		
Between coil de-energization and:		**N.O. contact opening**	10…30 ms					10…30 ms		
		N.C. contact closing	10…30 ms					10…30 ms		

Mounting characteristics and conditions for use

Contactor types		AC / DC operated	AF400	AF460	AF580	AF750	AF1250	AF1350	AF1650	AF2050
Mounting positions										
			Max. add-on N.O. or N.C. auxiliary contacts: see accessory fitting details for 3-pole contactor AF400 ... AF2050							
Control voltage / Ambient temperature										
	Mounting positions	1, 1±30°, 2, 3, 4, 5	**at θ ≤ 70 °C**	0.85 x Uc min…1.1 x Uc max.						
		6	Unauthorized							
Mounting distances			The contactors can be assembled side by side							
Fixing	On rail according to IEC 60715, EN 60715		–							
	By screws (not supplied)		4 x M5		4 x M6			4 x M8		

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AF09 ... AF38 3-pole contactors
Technical data

Connecting characteristics

Contactor types	AC / DC operated	AF09	AF12	AF16	AF26	AF30	AF38
Main terminals		Screw terminals with cable clamp					
Connection capacity (min. ... max.)							
Main conductors (poles)							
Rigid Solid (≤ 4 mm²)	**1 x**	1...6 mm²			2.5...10 mm²		
Rigid Stranded (≥ 6 mm²)	**2 x**	1...6 mm²			2.5...10 mm²		
Flexible with non insulated ferrule	**1 x**	0.75...6 mm²			1.5...10 mm²		
	2 x	0.75...6 mm²			1.5...10 mm²		
Flexible with insulated ferrule	**1 x**	0.75...4 mm²			1.5...10 mm²		
	2 x	0.75...2.5 mm²			1.5...4 mm²		
Bars or lugs	**L <**	9.6 mm			12.5 mm		
Connection capacity acc. to UL/CSA	**1 or 2 x**	AWG 16...10			AWG 14...8		
Stripping length		10 mm			14 mm		
Tightening torque		1.5 Nm / 13 lb.in			2.5 Nm / 22 lb.in		
Auxiliary conductors (built-in auxiliary terminals + coil terminals)							
Rigid solid	**1 x**	1...2.5 mm²					
	2 x	1...2.5 mm²					
Flexible with non insulated ferrule	**1 x**	0.75...2.5 mm²					
	2 x	0.75...2.5 mm²					
Flexible with insulated ferrule	**1 x**	0.75...2.5 mm²					
	2 x	0.75...1.5 mm²					
Lugs	**L <**	8 mm					
Connection capacity acc. to UL/CSA	**1 or 2 x**	AWG 18...14					
Stripping length		10 mm					
Tightening torque							
Coil terminals		1.2 Nm / 11 lb.in					
Built-in auxiliary terminals		1.2 Nm / 11 lb.in					
Degree of protection acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529							
Main terminals		IP20					
Coil terminals		IP20					
Built-in auxiliary terminals		IP20					
Screw terminals		Delivered in open position, screws of unused terminals must be tightened					
Main terminals		M3.5			M4		
	Screwdriver type	Flat Ø 5.5 / Pozidriv 2			Flat Ø 6.5 / Pozidriv 2		
Coil terminals		M3.5					
	Screwdriver type	Flat Ø 5.5 / Pozidriv 2					
Built-in auxiliary terminals		M3.5					
	Screwdriver type	Flat Ø 5.5 / Pozidriv 2					

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A40 … A110, AL, AE, TAL, TAE and AF50 … AF110 3-pole contactors
Technical data

Connecting characteristics

Contactor types			**AC operated**	A40	A50	A63	A75	A95	A110
			DC operated	AL40	AE50	AE63	AE75	–	–
				TAL40	TAE50	–	TAE75	–	–
			AC / DC operated	–	AF50	AF63	AF75	AF95	AF110
Main terminals				Screw terminals with double connector 2 x (5.6 x 6.5 mm)	Screw terminals with single connector (13 x 10 mm)			Screw terminals with single connector (14 x 14 mm)	
Connection capacity (min. ... max.)									
Main conductors (poles)									
	Rigid	Solid (≤ 4 mm²)	**1 x**	2.5...16 mm²	6...50 mm²			10...95 mm²	
		Stranded (≥ 6 mm²)	**2 x**	2.5...16 mm²	6...25 mm²			6...35 mm²	
	Flexible with ferrule		**1 x**	2.5...10 mm²	6...35 mm²			10...70 mm² (1)	
			2 x	2.5...10 mm²	6...16 mm²			6...35 mm² (1)	
	Bars or lugs		**L ≤**	–	–			30 mm (2)	
			I >	–	–			6 mm	
Connection capacity acc. to UL/CSA			**1 or 2 x**	AWG 8...4	AWG 8...1			AWG 6...2/0	
Tightening torque		Recommended		2.30 Nm / 20 lb.in	4.00 Nm / 35 lb.in			8 Nm / 71 lb.in	
		Max.		2.60 Nm	4.50 Nm			9 Nm	
Auxiliary conductors									
(built-in auxiliary terminals + coil terminals)									
	Rigid solid		**1 x**	1...4 mm²				0.75...2.5 mm²	
			2 x	1...4 mm²				0.75...2.5 mm²	
	Flexible with ferrule		**1 x**	0.75...2.5 mm²	1...2.5 mm²			0.75...2.5 mm²	
			2 x	0.75...2.5 mm²					
	Lugs		**L ≤**	8 mm					
			I >	3.7 mm					
Connection capacity acc. to UL/CSA			**1 or 2 x**	AWG 18...14					
Tightening torque									
Coil terminals		Recommended		1.00 Nm / 9 lb.in					
		Max.		1.20 Nm					
Built-in auxiliary terminals		Recommended		1.00 Nm / 9 lb.in	–			–	
		Max.		1.20 Nm	–			–	
Degree of protection									
acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529									
Main terminals				IP20	IP10				
Coil terminals				IP20					
Built-in auxiliary terminals				IP20	–			–	
Screw terminals				Delivered in open position, screws of unused terminals must be tightened					
Main terminals				M5	M6			M8	
			Screwdriver type	Flat Ø 6.5 / Pozidriv 2				Hexagon socket (s = 4 mm)	
Coil terminals				M3.5					
			Screwdriver type	Flat Ø 5.5 / Pozidriv 2					
Built-in auxiliary terminals				M3.5	–				
			Screwdriver type	Flat Ø 5.5 / Pozidriv 2	–				

(1) A(F)95 / A(F)110: use flexible without ferrule.
(2) With LW110 enlargement piece, see “Accessories”.

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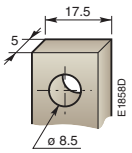
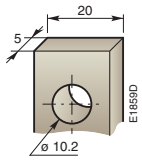
A145 … A300 and
AF145 … AF300 3-pole contactors
Technical data

Connecting characteristics

Contactor types		AC operated	A145	A185	A210	A260	A300
		AC / DC operated	AF145	AF185	AF210	AF260	AF300
Main terminals Flat type							
Connection capacity (min. ... max.)							
Main conductors (poles)							
Rigid with connector	Single for Cu cable		6…185 mm²		16…240 mm²		
	Single for Al/Cu cable		25…150 mm²		120…240 mm²		
	Double for Al/Cu cable		–		2 x 95…120 mm²		
Bars or lugs		**L** ≤	24 mm		32 mm		
		Ø >	8 mm		10 mm		
Connection capacity acc. to UL/CSA		**1 or 2 x**	6 - 250 MCM		4 - 500 MCM (1)		
Tightening torque	Recommended		18 Nm / 160 lb.in		28 Nm / 247 lb.in		
	Max.		20 Nm		30 Nm		
Auxiliary conductors (coil terminals)							
Rigid solid		**1 x**	1…4 mm²				
		2 x	1…4 mm²				
Flexible with ferrule		**1 x**	0.75…2.5 mm²				
		2 x	0.75…2.5 mm²				
Lugs		**L** ≤	8 mm				
		l >	3.7 mm				
Connection capacity acc. to UL/CSA		**1 or 2 x**	AWG 18…14				
Tightening torque	Recommended		1.00 Nm / 9 lb.in				
	Max.		1.20 Nm				
Degree of protection acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529							
Main terminals			IP00				
Coil terminals			IP20				
Screw terminals							
Main terminals			M8		M10		
			Screws and bolts				
Coil terminals (delivered in open position)			M3.5				
		Screwdriver type	Flat Ø 5.5 mm / Pozidriv 2				

(1) With LW110 enlargement piece: see "Accessories".

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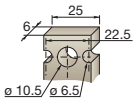
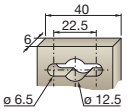
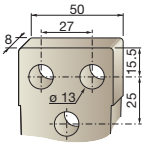
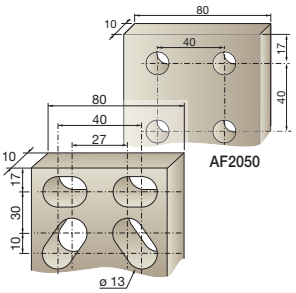
AF400 ... AF2050 3-pole contactors
Technical data

Connecting characteristics

Contactor types		AC / DC operated	AF400	AF460	AF580	AF750	AF1250	AF1350	AF1650	AF2050
Main terminals Flat type					 AF580 AF750		 AF1250	 AF1350 AF1650		AF2050
Connection capacity (min. ... max.)										
Main conductors (poles)										
Rigid with connector		Single for Cu cable	240 mm²		300 mm²			–		
		Single for Al/Cu cable	240 mm²		300 mm²			–		
		Double for Al/Cu cable	2 x 240 mm²		3 x 185 mm²			–		
Bars or lugs		L ≤	47 mm		52 mm			100 mm		
		Ø >	10 mm		12 mm			12 mm		
Connection capacity acc. to UL/CSA		1 or 2 x	2//250 - 500 MCM		3// 2/0 - 500 MCM			1/0 - 750 MCM		
Tightening torque	Recommended		35 Nm / 310 lb.in		45 Nm / 398 lb.in			45 Nm / 398 lb.in		
	Max.		40 Nm		49 Nm			49 Nm		
Auxiliary conductors (coil terminals)										
Rigid solid		1 x	1…4 mm²							
		2 x	1…4 mm²							
Flexible with ferrule		1 x	0.75…2.5 mm²							
		2 x	0.75…2.5 mm²							
Lugs		L ≤	8 mm							
		I >	3.7 mm							
Connection capacity acc. to UL/CSA		1 or 2 x	AWG 18…14							
Tightening torque	Recommended		1.00 Nm / 9 lb.in							
	Max.		1.20 Nm							
Degree of protection acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529										
Main terminals			IP00							
Coil terminals			IP20							
Screw terminals										
Main terminals			M10		M12					
			Screws and bolts							
Coil terminals (delivered in open position)			M3.5							
		Screwdriver type	Flat Ø 5.5 mm / Pozidriv 2							

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AF09 ... AF38 3-pole contactors
Technical data

Built-in auxiliary contacts according to IEC

Contactor types	AC / DC operated	AF09	AF12	AF16	AF26	AF30	AF38
Rated operational voltage Ue max.		690 V					
Rated frequency (without derating)		50 / 60 Hz					
Conventional free air thermal current Ith - θ ≤ 40 °C		16 A					
Ie / Rated operational current AC-15							
acc. to IEC 60947-5-1	24-127 V 50/60 Hz	6 A					
	220-240 V 50/60 Hz	4 A					
	400-440 V 50/60 Hz	3 A					
	500 V 50/60 Hz	2 A					
	690 V 50/60 Hz	2 A					
Making capacity AC-15		10 x Ie AC-15 acc. to IEC 60947-5-1					
Breaking capacity AC-15		10 x Ie AC-15 acc. to IEC 60947-5-1					
Ie / Rated operational current DC-13							
acc. to IEC 60947-5-1	24 V DC	6 A / 144 W					
	48 V DC	2.8 A / 134 W					
	72 V DC	1 A / 72 W					
	110 V DC	0.55 A / 60 W					
	125 V DC	0.55 A / 69 W					
	220 V DC	0.27 A / 60 W					
	250 V DC	0.27 A / 68 W					
	400 V DC	0.15 A / 60 W					
	500 V DC	0.13 A / 65 W					
	600 V DC	0.1 A / 60 W					
Short-circuit protection device gG type fuse		10 A					
Rated short-time withstand current Icw	for 1.0 s	100 A					
	for 0.1 s	140 A					
Minimum switching capacity		12 V / 3 mA					
with failure rate acc. to IEC 60947-5-4		10^{-7}					
Non-overlapping time between N.O. and N.C. contacts		≥ 2 ms					
Power dissipation per pole at 6 A		0.1 W					
Max. electrical switching frequency	AC-15	1200 cycles/h					
	DC-13	900 cycles/h					
Mechanically linked contacts acc. to annex L of IEC 60947-5-1		Built-in N.O. or N.C. auxiliary contacts and additional N.O. or N.C. auxiliary contacts (CA4, CAL4, CAT4 aux. contact blocks) are mechanically linked contacts.					
Mirror contacts acc. to annex F of IEC 60947-4-1		Built-in N.C. auxiliary contacts or additional N.C. auxiliary contacts (CA4, CAL4, CAT4 aux. contact blocks) are mirror contacts.					

Built-in auxiliary contacts according to UL / CSA

Contactor types	AC / DC operated	AF09	AF12	AF16	AF26	AF30	AF38
Max. operational voltage		600 V AC, 600 V DC					
Pilot duty		A600, Q600					
AC thermal rated current		10 A					
AC maximum volt-ampere making		7200 VA					
AC maximum volt-ampere breaking		720 VA					
DC thermal rated current		2.5 A					
DC maximum volt-ampere making-breaking		69 VA					

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A40, AL40 and TAL40 3-pole contactors
Technical data

Built-in auxiliary contacts according to IEC

Contactor types	**AC operated**	**A40**
	DC operated	**AL40, TAL40**
Rated operational voltage Ue max.		690 V
Rated frequency (without derating)		50/60 Hz
Conventional free air thermal current Ith - θ ≤ 40 °C		16 A
Ie / Rated operational current AC-15		
acc. to IEC 60947-5-1	**24-127 V 50/60 Hz**	6 A
	220-240 V 50/60 Hz	4 A
	380-440 V 50/60 Hz	3 A
	500 V 50/60 Hz	2 A
	690 V 50/60 Hz	2 A
Making capacity AC-15		10 x Ie AC-15 acc. to IEC 60947-5-1
Breaking capacity AC-15		10 x Ie AC-15 acc. to IEC 60947-5-1
Ie / Rated operational current DC-13		
acc. to IEC 60947-5-1	**24 V DC**	6 A / 144 W
	48 V DC	2.8 A / 134 W
	72 V DC	2 A / 144 W
	110 V DC	1.1 A / 121 W
	125 V DC	1.1 A / 138 W
	220 V DC	0.55 A / 121 W
	250 V DC	0.55 A / 138 W
Short-circuit protection device gG type fuse		10 A
Rated short-time withstand current Icw	**for 1.0 s**	100 A
	for 0.1 s	140 A
Minimum switching capacity		17 V / 5 mA
with failure rate acc. to IEC 60947-5-4		≤ 10^{-7} for AL40 and TAL40 contactors
Non-overlapping time between N.O. and N.C. contacts		≥ 2 ms
Power dissipation per pole at 6 A		0.1 W
Max. electrical switching frequency	**AC-15**	1200 cycles/h
	DC-13	900 cycles/h
Mechanically linked contacts acc. to annex L of IEC 60947-5-1		Built-in N.O. or N.C. auxiliary contacts and additional N.O. or N.C. auxiliary contacts of 4-pole CA5 are mechanically linked contacts.
Mirror contacts acc. to annex F of IEC 60947-4-1		Built-in N.C. auxiliary contacts or additional N.C. auxiliary contacts (CA5, CAL5-11) are mirror contacts.

Built-in auxiliary contacts according to UL / CSA

Contactor types	**AC operated**	**A40**
	DC operated	**AL40, TAL40**
Max. operational voltage		600 V AC, 600 V DC
Pilot duty		A600, P300
AC thermal rated current		10 A
AC maximum volt-ampere making		7200 VA
AC maximum volt-ampere breaking		720 VA
DC thermal rated current		5 A
DC maximum volt-ampere making-breaking		138 VA

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3-pole contactors
Electrical durability and utilization categories

General

Utilization categories determine the current making and breaking conditions relating to the characteristics of the loads to be controlled by the contactors. International standard IEC 60947-4-1 and European standard EN 60947-4-1 are the standards to be referred to.

If Ic is the current to be broken by the contactor and Ie the rated operational current normally drawn by the load, then:

– Categories AC-1 and AC-3: Ic = Ie
– Category AC-2: Ic = 2.5 x Ie
– Category AC-4: Ic = 6 x Ie

Generally speaking Ic = m x Ie where m is a multiple of the load operational current.

On next pages, the curves corresponding to categories AC-1, AC-3 and AC-4 represent the electrical durability variation of standard contactors in relation to the breaking current Ic.

Electrical durability is expressed in millions of operating cycles.

Curve utilization mode

Electrical durability forecast and contactor selection for categories AC-1, AC-2, AC-3 or AC-4

- Note the characteristics of the load to be controlled:
– Operational voltage ..... Ue
– Current normally drawn ..... Ie (Ue / Ie / kW relation for motors, see "Motor rated operational powers and currents").
– Utilization category ..... AC-1, AC-2, AC-3 or AC-4
– Breaking current ..... Ic = Ie for AC-1 and for AC-3 ; Ic = 2.5 x Ie for AC-2 ; Ic = 6 x Ie for AC-4
- Define the number of operating cycles N required.
- On the diagram corresponding to the operational category, select the contactor with the curve immediately above the intersection point (Ic ; N).

Electrical durability forecast and contactor selection for mixed duty motor control: AC-3 (Ic = Ie) type switching off while "motor running" and, occasionally, AC-4 (Ic = 6 x Ie) type switching off while "motor accelerating"

- Note the characteristics of the motor to be controlled:
– Operational voltage ..... Ue
– Current normally drawn while "motor running" ..... Ie (Ue / Ie / kW relation for motors, see "Motor rated operational powers and currents")
– Breaking current for AC-3 ..... Ic = Ie
– Breaking current for AC-4 while "motor accelerating" ..... Ic = 6 x Ie
– Percentage of AC-4 operating cycles ..... K (on the basis of the total number of operating cycles)
- Define the total number of operating cycles N required.
- Note the smallest contactor rating compatible for AC-3 (Ue / Ie) on Main pole utilization characteristic table (see “Technical data”).
- For the selected contactor make a note of the following in relation to the voltage using diagram AC-3 in next pages:
– The number of operating cycles A for Ic = Ie (AC-3)
– The number of operating cycles B for Ic = 6 x Ie (AC-4)
- Calculate the estimated number of cycles N’ (N’ is always below A)

$$N' = \frac{A}{1 + 0.01\ K\ (A/B - 1)}$$

- If N' is too low in relation to the target N, calculate the estimated number of cycles for a higher contactor rating.

Case of uninterrupted duty

For uninterrupted duty, some verifications of preventing maintenance are necessary to check the functionality of the concerned product (consult us).

The combinated effect of environmental conditions and the proper temperature of the product may require some disposals. As a matter of fact, for this duty, the use duration prevails over the number of operating cycles.

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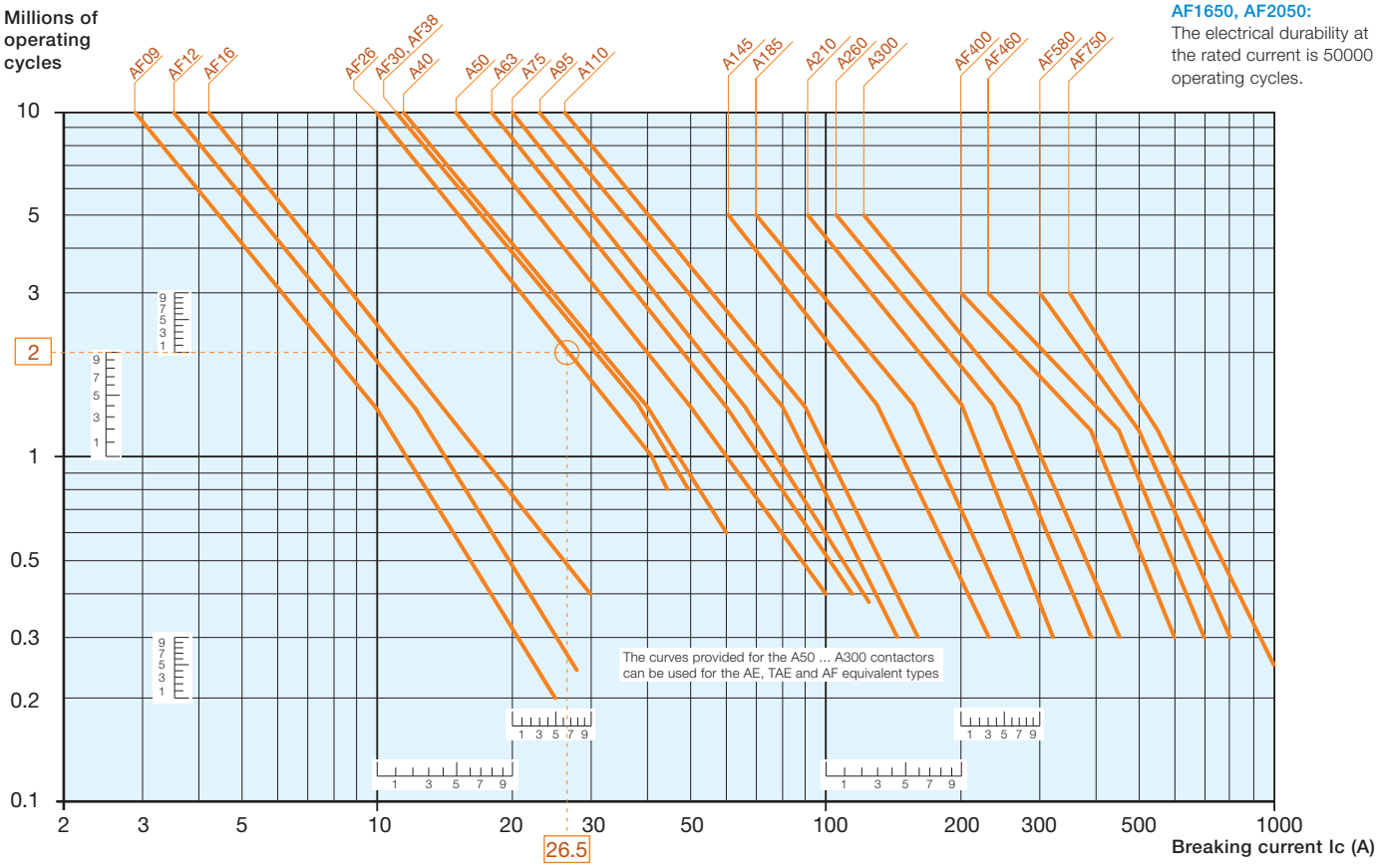
3-pole contactors
Electrical durability

Electrical durability for AC-1 utilization category - Ue ≤ 690 V
Ambient temperature ≤ 60 °C for AF09 ... AF38, ≤ 55 °C for A40 ... AF2050

Switching non-inductive or slightly inductive loads. The breaking current Ic for AC-1 is equal to the rated operational current of the load.
Maximum electrical switching frequency: see "Technical data".



AF1250, AF1350, AF1650, AF2050:
The electrical durability at the rated current is 50000 operating cycles.

Example:
Ic / AC-1 = 26.5 A – Electrical durability required = 2 millions operating cycles.
Using the AC-1 curves above select the AF26 contactor at intersection "○" (26.5 A / 2 millions operating cycles).

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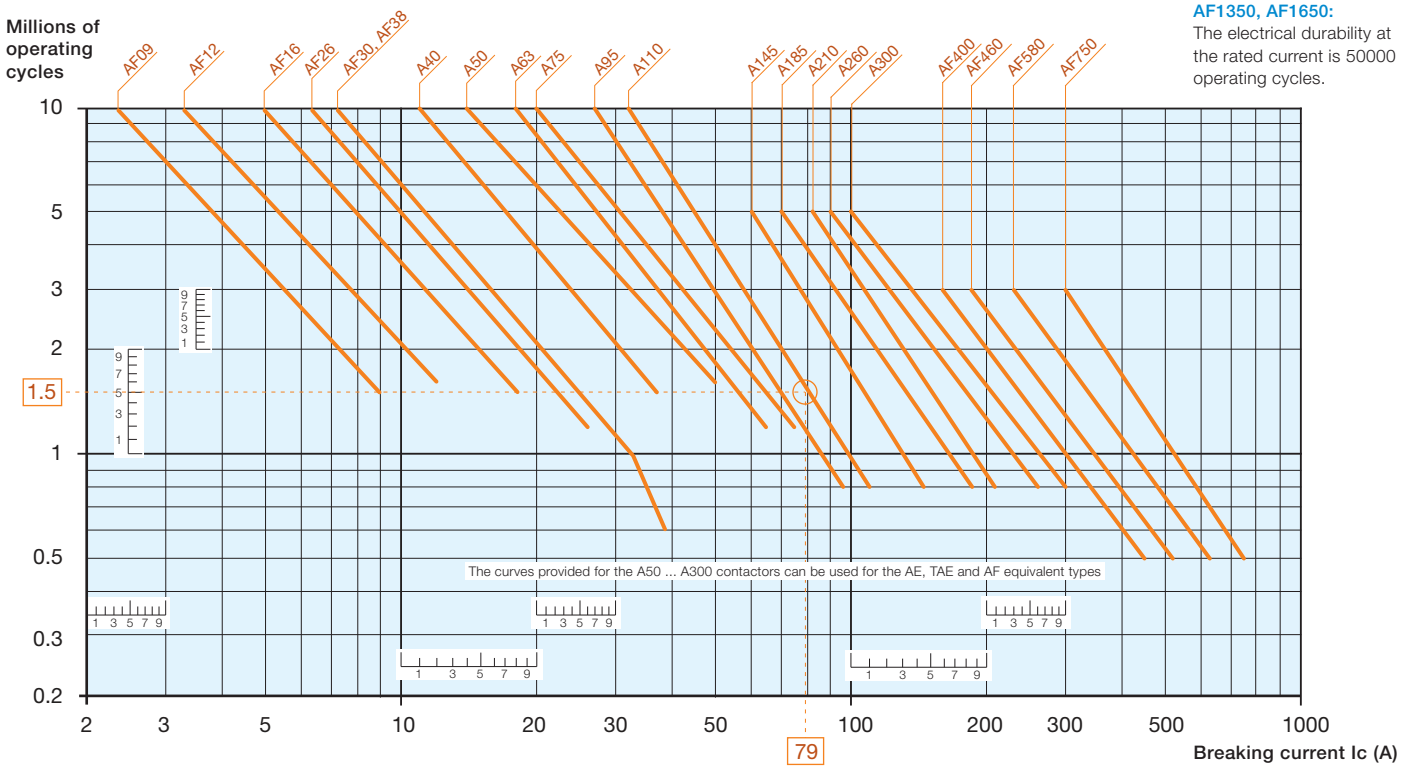
3-pole contactors
Electrical durability

Electrical durability for AC-3 utilization category - Ue ≤ 440 V
Ambient temperature ≤ 60 °C for AF09 ... AF38, ≤ 55 °C for A40 ... AF1650

Switching cage motors: starting and switching off running motors. The breaking current Ic for AC-3 is equal to the rated operational current Ie (Ie = motor full load current). Maximum electrical switching frequency: see "Technical data".



AF1350, AF1650:
The electrical durability at the rated current is 50000 operating cycles.

Example:

Motor power 40 kW for AC-3 - Ue = 400 V and Ie = 79 A utilization – Electrical durability required = 1.5 million operating cycles.
For AC-3: Ic = Ie. Select the A110 contactor at intersection "○" (79 A / 1.5 million operating cycles) on the curves (AC-3 - Ue ≤ 440 V).

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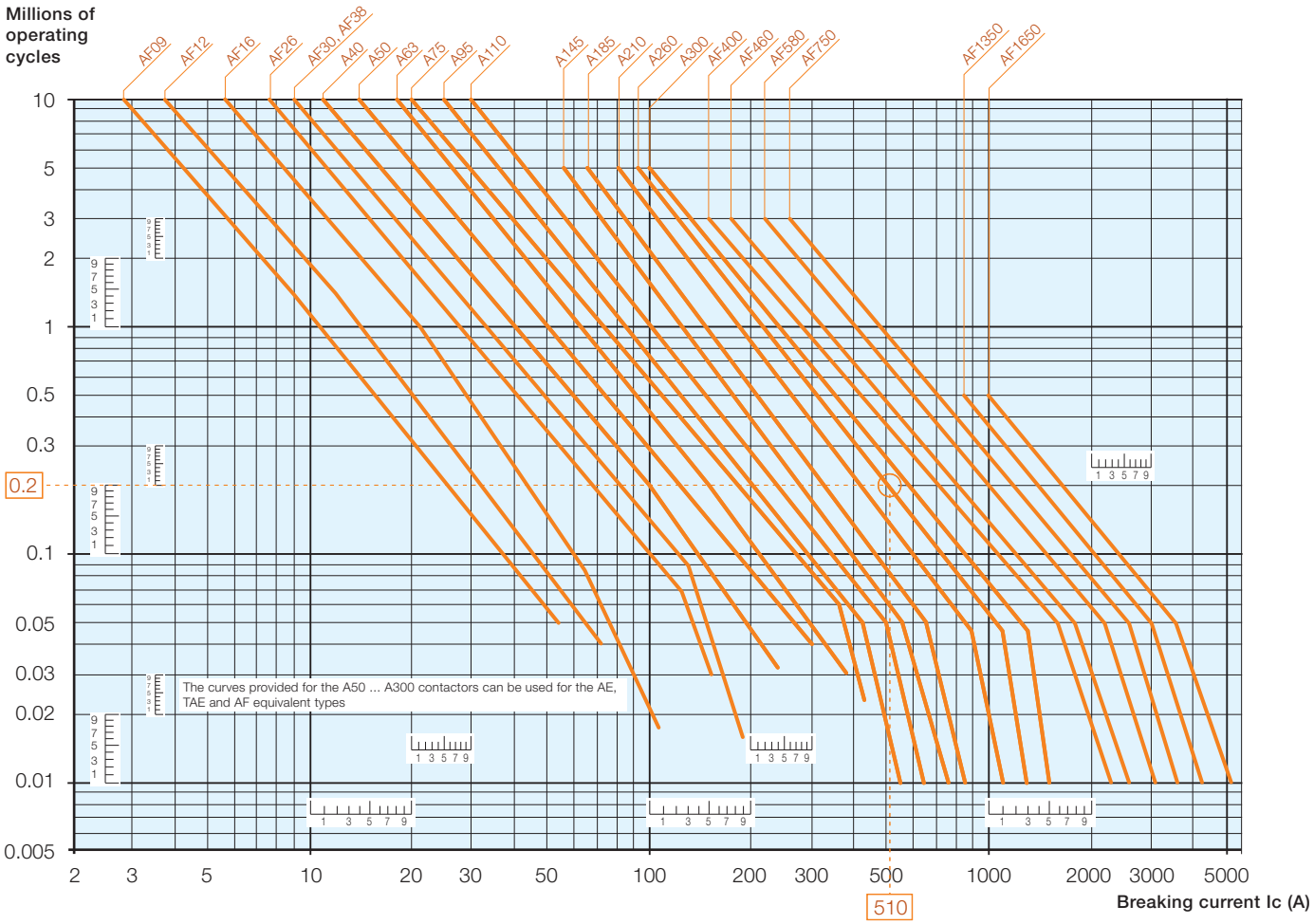
3-pole contactors
Electrical durability

Electrical durability for AC-2 or AC-4 utilization category - Ue < 440 V
Ambient temperature ≤ 60 °C for AF09 ... AF38, ≤ 55 °C for A40 ... AF1650

Switching cage motors: starting, reverse operation and step-by-step operation. The breaking current Ic is equal to 2.5 x Ie for AC-2 and 6 x Ie for AC-4, keeping in mind that Ie is the motor rated operational current (Ie = motor full-load current).
Maximum electrical switching frequency: see "Technical data".



Example:
Motor power 45 kW for AC-4 - Ue = 400 V and Ie = 85 A utilization – Electrical durability required = 0.2 million operating cycles.
For AC-4: Ic = 6 x Ie = 510 A - Select the A260 contactor at intersection "○" (510 A / 0.2 million operating cycles) on the curves (AC-4 - Ue ≤ 440 V).

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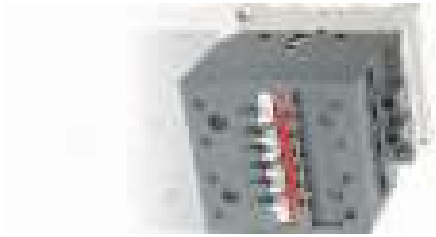
Notes



AF, A and EK 4-pole contactors

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Ordering details

25 to 55 A AC-1

AF09 ... AF38	AC / DC operated	5/58
AF09Z ... AF38Z	AC / DC operated - low consumption	5/59
Main accessories		5/60

70 to 125 A AC-1

A45 ... A75	AC operated	5/63
AE45 ... AE75	DC operated	5/64
AF45 ... AF75	AC / DC operated	5/65
Main accessories		5/66

200 to 1000 A AC-1

EK110 ... EK150	AC operated	5/68
EK110 ... EK150	DC operated	5/69
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EK175 ... EK550	DC operated	5/71
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Accessories for AF09 ... AF38 contactors and NF contactor relays	5/115
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Voltage code table 5/157

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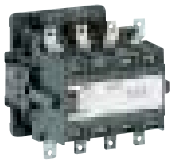
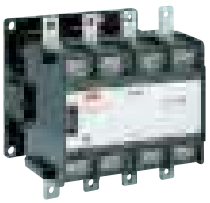
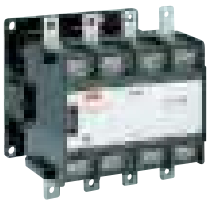
4-pole contactors

IEC	**AC-1 Rated operational current**	θ ≤ 40 °C, 690 V	**A**	**25**	**30**	**45**	**55**	**70**	**100**	**125**
UL/CSA	**General use rating**	600 V	**A**	**25**	**30**	**45**	**55**	**80**	**80**	**105**
AC Control supply			Type	**AF09**	**AF16**	**AF26**	**AF38**	**A45**	**A50**	**A75**
DC Control supply			Type	**AF09**	**AF16**	**AF26**	**AF38**	**AE45**	**AE50**	**AE75**
AC / DC Control supply			Type	**AF09**	**AF16**	**AF26**	**AF38**	**AF45**	**AF50**	**AF75**
IEC	**AC-1 Rated operational current**	θ ≤ 40 °C	**A**	**25**	**30**	**45**	**55**	**70**	**100**	**125**
		θ ≤ 55 °C (1)	**A**	**25**	**30**	**40**	**45**	**60**	**85**	**105**
		θ ≤ 70 °C	**A**	**22**	**26**	**32**	**37**	**50**	**70**	**85**
	With conductor cross sectional area		**mm²**	**4**	**6**	**10**	**16**	**25**	**35**	**50**
	Rated operational voltage Ue max.		**V**	**690**	**690**	**690**	**690**	**690**	**690**	**690**
UL/CSA	**General use rating**	600 V	**A**	**25**	**30**	**45**	**55**	**65**	**80**	**105**

(1) θ ≤ 60 °C for AF09 ... AF38 contactors

Main accessories

Auxiliary contact blocks	Front mounting	**CA4-10** (1 x N.O.), **CA4-01** (1 x N.C.)	**CA5-10** (1 x N.O.), **CA5-01** (1 x N.C.)
	Side mounting	**CAL4-11** (1 x N.O. + 1 x N.C.)	**CAL5-11** (1 x N.O. + 1 x N.C.)
Timers	Pneumatic (Front mounting)		**TP40DA, TP180DA** Direct timing **TP40IA, TP180IA** Inverse timing
Interlocking units (compact reversing contactors)	Mechanical	**VM4**	
	Mechanical / Electrical	**VEM4**	**VE5-2**
Surge suppressors AF contactors have built-in surge protection	Varistor (AC / DC)		**RV5** (24...440 V)
	RC Type (AC)		**RC5-2** (24...440 V)
	Transil diode (DC)		**RT5** (12...264 V)

	200	250	300	350	550	800	1000
	170	200	250	300	420	540	–
	EK110	EK150	EK175	EK210	EK370	EK550	EK1000
	EK110	EK150	EK175	EK210	EK370	EK550	EK1000
	–	–	–	–	–	–	–
	200	250	300	350	550	800	1000
	180	230	270	310	470	650	800
	155	200	215	250	400	575	720
	95	150	185	240	2 x 185	2 x 240	2 x 300
	1000	1000	1000	1000	1000	1000	1000
	170	200	250	300	420	540	–

	CAL16-11 (1 x N.O. + 1 x N.C.)						
					VH800		
	VH145		VH300				
	RC-EH300				RC-EH800		

1SBC101569S0201

AF09 ... AF38 4-pole contactors
25 to 55 A AC-1
AC / DC operated

AF09-40-00

AF26-40-00

5

Description

AF09 ... AF38 4-pole contactors are mainly used for controlling non-inductive or slightly inductive loads (i.e. resistance furnaces...) and generally for controlling power circuits up to 690 V AC and 440 V DC. These contactors are of the block type design with 4 main poles.

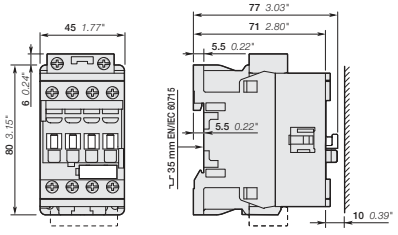
– control circuit: AC or DC operated with electronic coil interface accepting a wide control voltage range (e.g. 100...250 V AC and DC), only 4 coils to cover control voltages between 24...500 V 50/60 Hz and 20...500 V DC
  - can manage large control voltage variations
  - reduced panel energy consumption
  - very distinct closing and opening.
– built-in surge suppression
– add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

Ordering details

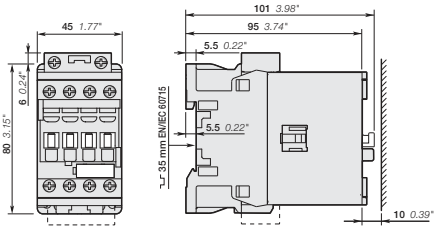
IEC	UL/CSA	Rated control circuit voltage Uc min. ... Uc max.		Auxiliary contacts fitted		Type	Order code		Weight
Rated operational current θ ≤ 40 °C AC-1	General use rating 600 V AC								Pkg (1 pce)
A	A	V 50/60 Hz	V DC						kg
4 N.O. main poles									
25	25	24...60	20...60 (1)	0	0	AF09-40-00-11	1SBL137201R1100		0.270
		48...130	48...130	0	0	AF09-40-00-12	1SBL137201R1200		0.270
		100...250	100...250	0	0	AF09-40-00-13	1SBL137201R1300		0.270
		250...500	250...500	0	0	AF09-40-00-14	1SBL137201R1400		0.310
30	30	24...60	20...60 (1)	0	0	AF16-40-00-11	1SBL177201R1100		0.270
		48...130	48...130	0	0	AF16-40-00-12	1SBL177201R1200		0.270
		100...250	100...250	0	0	AF16-40-00-13	1SBL177201R1300		0.270
		250...500	250...500	0	0	AF16-40-00-14	1SBL177201R1400		0.310
45	45	24...60	20...60 (1)	0	0	AF26-40-00-11	1SBL237201R1100		0.360
		48...130	48...130	0	0	AF26-40-00-12	1SBL237201R1200		0.360
		100...250	100...250	0	0	AF26-40-00-13	1SBL237201R1300		0.360
		250...500	250...500	0	0	AF26-40-00-14	1SBL237201R1400		0.400
55	55	24...60	20...60 (1)	0	0	AF38-40-00-11	1SBL297201R1100		0.360
		48...130	48...130	0	0	AF38-40-00-12	1SBL297201R1200		0.360
		100...250	100...250	0	0	AF38-40-00-13	1SBL297201R1300		0.360
		250...500	250...500	0	0	AF38-40-00-14	1SBL297201R1400		0.400
2 N.O. + 2 N.C. main poles									
25	25	24...60	20...60 (1)	0	0	AF09-22-00-11	1SBL137501R1100		0.270
		48...130	48...130	0	0	AF09-22-00-12	1SBL137501R1200		0.270
		100...250	100...250	0	0	AF09-22-00-13	1SBL137501R1300		0.270
		250...500	250...500	0	0	AF09-22-00-14	1SBL137501R1400		0.310
30	30	24...60	20...60 (1)	0	0	AF16-22-00-11	1SBL177501R1100		0.270
		48...130	48...130	0	0	AF16-22-00-12	1SBL177501R1200		0.270
		100...250	100...250	0	0	AF16-22-00-13	1SBL177501R1300		0.270
		250...500	250...500	0	0	AF16-22-00-14	1SBL177501R1400		0.310
45	45	24...60	20...60 (1)	0	0	AF26-22-00-11	1SBL237501R1100		0.360
		48...130	48...130	0	0	AF26-22-00-12	1SBL237501R1200		0.360
		100...250	100...250	0	0	AF26-22-00-13	1SBL237501R1300		0.360
		250...500	250...500	0	0	AF26-22-00-14	1SBL237501R1400		0.400
55	55	24...60	20...60 (1)	0	0	AF38-22-00-11	1SBL297501R1100		0.360
		48...130	48...130	0	0	AF38-22-00-12	1SBL297501R1200		0.360
		100...250	100...250	0	0	AF38-22-00-13	1SBL297501R1300		0.360
		250...500	250...500	0	0	AF38-22-00-14	1SBL297501R1400		0.400

(1) AF..-..-..-11 not suitable for direct control by PLC-output.

Main dimensions mm, *inches*



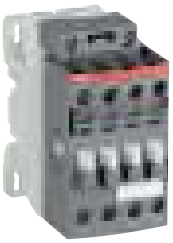
AF09, AF16



AF26, AF38

1SBC101375S0201

AF09Z ... AF38Z 4-pole contactors
25 to 55 A AC-1
AC / DC operated - low consumption



AF09Z-40-00

AF26Z-40-00

Description

AF09Z ... AF38Z 4-pole contactors are mainly used for controlling non-inductive or slightly inductive loads (i.e. resistance furnaces...) and generally for controlling power circuits up to 690 V AC and 440 V DC. These contactors are of the block type design with 4 main poles.

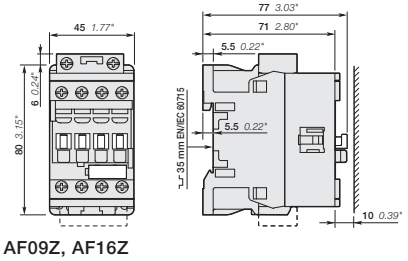
– control circuit: AC or DC operated with electronic coil interface accepting a wide control voltage range (e.g. 100...250 V AC and DC), only 4 coils to cover control voltages between 24...250 V 50/60 Hz and 12...250 V DC
  - can manage large control voltage variations
  - allow direct control by PLC-output ≥ 24 V DC 500 mA
  - reduced panel energy consumption
  - very distinct closing and opening
  - can withstand short voltage dips and voltage sags (SEMI F47-0706 conditions of use on request).
– built-in surge suppression
– add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

Ordering details

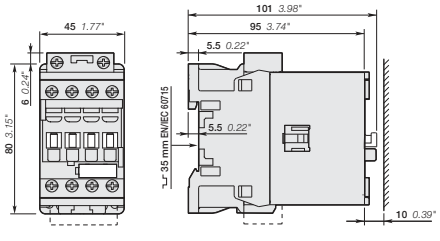
IEC Rated operational current θ ≤ 40 °C AC-1 A	UL/CSA General use rating 600 V AC A	Rated control circuit voltage Uc min. ... Uc max. V 50/60 Hz	 V DC	Auxiliary contacts fitted NO	 NC	Type	Order code		Weight Pkg (1 pce) kg
4 N.O. main poles									
25	25	-	12...20	0	0	AF09Z-40-00-20	1SBL136201R2000		0.310
		24...60	20...60	0	0	AF09Z-40-00-21	1SBL136201R2100		0.310
		48...130	48...130	0	0	AF09Z-40-00-22	1SBL136201R2200		0.310
		100...250	100...250	0	0	AF09Z-40-00-23	1SBL136201R2300		0.310
30	30	-	12...20	0	0	AF16Z-40-00-20	1SBL176201R2000		0.310
		24...60	20...60	0	0	AF16Z-40-00-21	1SBL176201R2100		0.310
		48...130	48...130	0	0	AF16Z-40-00-22	1SBL176201R2200		0.310
		100...250	100...250	0	0	AF16Z-40-00-23	1SBL176201R2300		0.310
45	45	-	12...20	0	0	AF26Z-40-00-20	1SBL236201R2000		0.400
		24...60	20...60	0	0	AF26Z-40-00-21	1SBL236201R2100		0.400
		48...130	48...130	0	0	AF26Z-40-00-22	1SBL236201R2200		0.400
		100...250	100...250	0	0	AF26Z-40-00-23	1SBL236201R2300		0.400
55	55	-	12...20	0	0	AF38Z-40-00-20	1SBL296201R2000		0.400
		24...60	20...60	0	0	AF38Z-40-00-21	1SBL296201R2100		0.400
		48...130	48...130	0	0	AF38Z-40-00-22	1SBL296201R2200		0.400
		100...250	100...250	0	0	AF38Z-40-00-23	1SBL296201R2300		0.400
2 N.O. + 2 N.C. main poles									
25	25	-	12...20	0	0	AF09Z-22-00-20	1SBL136501R2000		0.310
		24...60	20...60	0	0	AF09Z-22-00-21	1SBL136501R2100		0.310
		48...130	48...130	0	0	AF09Z-22-00-22	1SBL136501R2200		0.310
		100...250	100...250	0	0	AF09Z-22-00-23	1SBL136501R2300		0.310
30	30	-	12...20	0	0	AF16Z-22-00-20	1SBL176501R2000		0.310
		24...60	20...60	0	0	AF16Z-22-00-21	1SBL176501R2100		0.310
		48...130	48...130	0	0	AF16Z-22-00-22	1SBL176501R2200		0.310
		100...250	100...250	0	0	AF16Z-22-00-23	1SBL176501R2300		0.310
45	45	-	12...20	0	0	AF26Z-22-00-20	1SBL236501R2000		0.400
		24...60	20...60	0	0	AF26Z-22-00-21	1SBL236501R2100		0.400
		48...130	48...130	0	0	AF26Z-22-00-22	1SBL236501R2200		0.400
		100...250	100...250	0	0	AF26Z-22-00-23	1SBL236501R2300		0.400
55	55	-	12...20	0	0	AF38Z-22-00-20	1SBL296501R2000		0.400
		24...60	20...60	0	0	AF38Z-22-00-21	1SBL296501R2100		0.400
		48...130	48...130	0	0	AF38Z-22-00-22	1SBL296501R2200		0.400
		100...250	100...250	0	0	AF38Z-22-00-23	1SBL296501R2300		0.400

Note: Only AF..Z contactors with DC control voltage 12...20 V DC need to respect the connection polarities indicated close to the coil terminals: A1+ for the positive pole and A2- for the negative pole.

Main dimensions mm, *inches*



AF09Z, AF16Z



AF26Z, AF38Z

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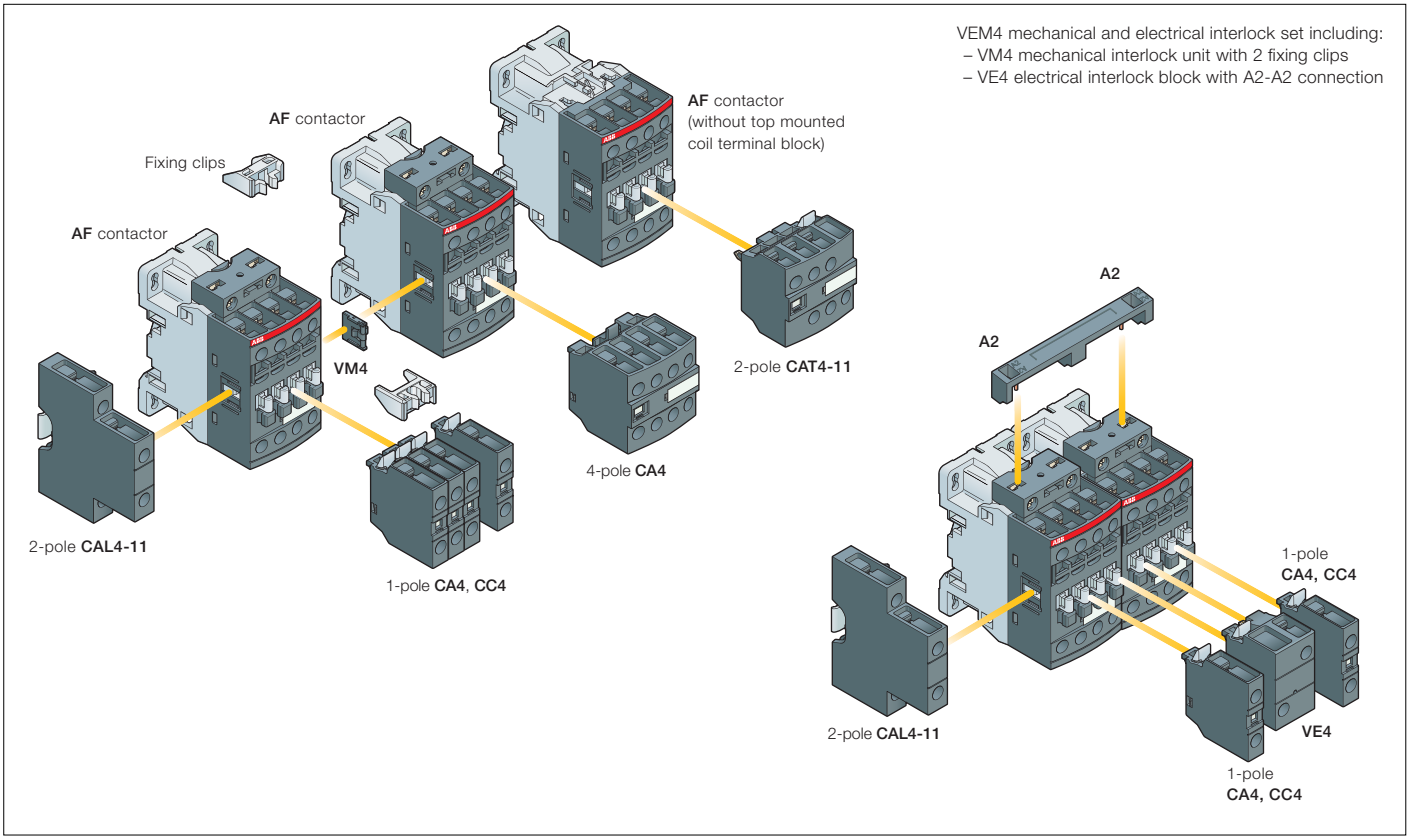
AF09 ... AF38 4-pole contactors
Main accessories

Contactor and main accessories (other accessories available)



Main accessory fitting details

Many configurations of accessories are possible depending on whether these are front-mounted or side-mounted.

Contactor types	Main poles		Built-in auxiliary contacts		Front-mounted accessories: Auxiliary contact blocks								Electrical and mechanical interlock set (between 2 contactors)		Side-mounted accessories: Auxiliary contact blocks		
					1-pole CA4 / 1-pole CC4		2-pole CAT4-11		4-pole CA4				VEM4		Left side: 2-pole CAL4-11		Right side
Max. add-on N.C. auxiliary contacts: 4 N.C. max. on positions 1, 2, 3, 4 and 3 N.C. max. on positions 1 ±30°, 5																	
AF09, AF16	4	0	0	0	4 max.	or	1	or	1			+	–	+	1		–
					2 max.	or	1		–			+	–	+	1	+	1
					3 max.		–		–		+	1		+	1	or	1
Max. add-on N.C. auxiliary contacts: 3 N.C. max. on positions 1, 2, 3, 4 and 2 N.C. max. on positions 1 ±30°, 5																	
AF26, AF38	4	0	0	0	4 max.	or	1	or	1			+	–	+	1		–
					2 max.	or	1		–			+	–	+	1	+	1
					3 max.		–		–		+	1		+	1	or	1
AF09, AF16	2	2	0	0	4 max.	or	1	or	1			+	–	+	1		–
AF26, AF38	2	2	0	0	2 max.	or	1		–			+	–	+	1	+	1

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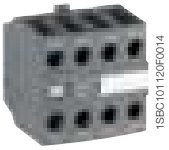
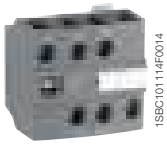
AF09 ... AF38 4-pole contactors
Main accessories

CA4-10

CAL4-11

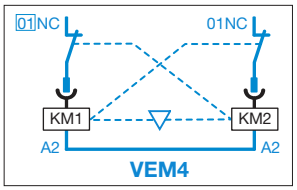


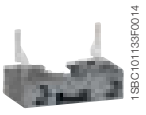
CA4-22E



CAT4-11E

VEM4





LDC4

BX4

BX4-CA

Ordering details (1)

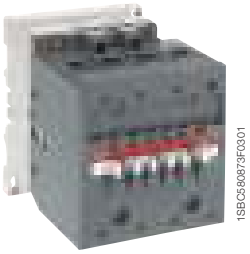
For contactors	Auxiliary contacts		Type	Order code		Pkg qty	Weight (1 pce) kg
Front-mounted instantaneous auxiliary contact blocks							
AF09 ... AF38..-40-00 AF09 ... AF38..-22-00	1 0	– –	CA4-10	1SBN010110R1010		1	0.014
	1 0	– –	CA4-10-T	1SBN010110T1010		10	0.014
	0 1	– –	CA4-01	1SBN010110R1001		1	0.014
	0 1	– –	CA4-01-T	1SBN010110T1001		10	0.014
	2 2	– –	CA4-22E	1SBN010140R1022		1	0.055
	3 1	– –	CA4-31E	1SBN010140R1031		1	0.055
	4 0	– –	CA4-40E	1SBN010140R1040		1	0.055
AF09 ... AF16..-40-00	0 4	– –	CA4-04E	1SBN010140R1004		1	0.055
Front-mounted auxiliary contact blocks with N.O. leading contact and N.C. lagging contact							
AF09 ... AF38..-40-00 AF09 ... AF38..-22-00	– –	1 0	CC4-10	1SBN010111R1010		1	0.014
	– –	0 1	CC4-01	1SBN010111R1001		1	0.014
Side-mounted instantaneous auxiliary contact blocks							
AF09 ... AF38..-40-00 AF09 ... AF38..-22-00	1 1	– –	CAL4-11	1SBN010120R1011		1	0.040
	1 1	– –	CAL4-11-T	1SBN010120T1011		10	0.040
Front-mounted instantaneous auxiliary contact and A1/A2 coil terminal blocks							
AF09 ... AF38..-40-00 AF09 ... AF38..-22-00	1 1	– –	CAT4-11E	1SBN010151R1011		1	0.040
Note: CAT4 not fittable on AF..Z contactors with DC control voltage 12...20 V DC.							
Mechanical interlock unit							
AF09 ... AF38..-40-00			VM4	1SBN030105T1000		10	0.005
Note: VM4 includes 2 fixing clips (BB4) to maintain together both contactors.							
Mechanical and electrical interlock set							
AF09, AF16..-40-00 AF26, AF38..-40-00	1 1	– –	VEM4	1SBN030111R1000		1	0.035
Note: – VEM4 includes a VM4 mechanical interlock unit with 2 fixing clips (BB4), a VE4 electrical interlock block. VE4 block must be used with A2-A2 connection to respect the electrical connection diagram. – VEM4 not fittable on AF..Z contactors with DC control voltage 12...20 V DC.							
Additional coil terminal block							
AF09 ... AF38			LDC4	1SBN070156T1000		10	0.010
Protective covers							
All 1-stack contactors			BX4	1SBN110108T1000		10	0.006
For 4-pole CA4 and 2-pole CAT4 auxiliary contact blocks			BX4-CA	1SBN110109W1000		50	0.001

(1) See "Main accessory fitting details" table.

1SBC101393S0201

Notes

A45 … A75 4-pole contactors
70 to 125 A AC-1
AC operated



A45-40-00

Description

A45 ... A75 4-pole contactors are mainly used for controlling non-inductive or slightly inductive loads (i.e. resistance furnaces...) and generally for controlling power circuits up to 690 V AC and 220 V DC.

These contactors are of the block type design with:

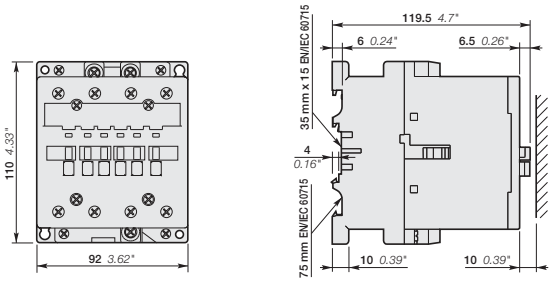
– 4 main poles
– control circuit: AC operated
– add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

Ordering details

IEC Rated operational current θ ≤ 40 °C AC-1 A	UL/CSA General use rating 600 V AC A	Rated control circuit voltage Uc (1) V 50 Hz	 V 60 Hz	Auxiliary contacts fitted		Type	Order code		Weight Pkg (1 pce) kg
4 N.O. main poles									
70	80	24	24	0	0	A45-40-00	1SBL331201R8100		1.390
		48	48	0	0	A45-40-00	1SBL331201R8300		1.390
		110	110...120	0	0	A45-40-00	1SBL331201R8400		1.390
		220...230	230...240	0	0	A45-40-00	1SBL331201R8000		1.390
		230...240	240...260	0	0	A45-40-00	1SBL331201R8800		1.390
		380...400	400...415	0	0	A45-40-00	1SBL331201R8500		1.390
		400...415	415...440	0	0	A45-40-00	1SBL331201R8600		1.390
100	80	24	24	0	0	A50-40-00	1SBL351201R8100		1.390
		48	48	0	0	A50-40-00	1SBL351201R8300		1.390
		110	110...120	0	0	A50-40-00	1SBL351201R8400		1.390
		220...230	230...240	0	0	A50-40-00	1SBL351201R8000		1.390
		230...240	240...260	0	0	A50-40-00	1SBL351201R8800		1.390
		380...400	400...415	0	0	A50-40-00	1SBL351201R8500		1.390
		400...415	415...440	0	0	A50-40-00	1SBL351201R8600		1.390
125	105	24	24	0	0	A75-40-00	1SBL411201R8100		1.390
		48	48	0	0	A75-40-00	1SBL411201R8300		1.390
		110	110...120	0	0	A75-40-00	1SBL411201R8400		1.390
		220...230	230...240	0	0	A75-40-00	1SBL411201R8000		1.390
		230...240	240...260	0	0	A75-40-00	1SBL411201R8800		1.390
		380...400	400...415	0	0	A75-40-00	1SBL411201R8500		1.390
		400...415	415...440	0	0	A75-40-00	1SBL411201R8600		1.390
2 N.O. + 2 N.C. main poles (2)									
70	80	24	24	0	0	A45-22-00	1SBL331501R8100		1.400
		48	48	0	0	A45-22-00	1SBL331501R8300		1.400
		110	110...120	0	0	A45-22-00	1SBL331501R8400		1.400
		220...230	230...240	0	0	A45-22-00	1SBL331501R8000		1.400
		230...240	240...260	0	0	A45-22-00	1SBL331501R8800		1.400
		380...400	400...415	0	0	A45-22-00	1SBL331501R8500		1.400
		400...415	415...440	0	0	A45-22-00	1SBL331501R8600		1.400
125	105	24	24	0	0	A75-22-00	1SBL411501R8100		1.400
		48	48	0	0	A75-22-00	1SBL411501R8300		1.400
		110	110...120	0	0	A75-22-00	1SBL411501R8400		1.400
		220...230	230...240	0	0	A75-22-00	1SBL411501R8000		1.400
		230...240	240...260	0	0	A75-22-00	1SBL411501R8800		1.400
		380...400	400...415	0	0	A75-22-00	1SBL411501R8500		1.400
		400...415	415...440	0	0	A75-22-00	1SBL411501R8600		1.400

(1) Other control voltages see voltage code table.
(2) These contactors are not suitable for a reversing starter or star-delta starter or for controlling a single load from 2 separate supplies. Please see technical data.

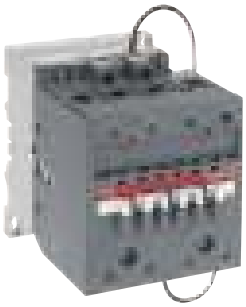
Main dimensions mm, *inches*



A45, A50, A75 4-pole

1SBC101377S0201

AE45 ... AE75 4-pole contactors
70 to 125 A AC-1
DC operated



AE50-40-00

5

Description

AE45 ... AE75 4-pole contactors are mainly used for controlling non-inductive or slightly inductive loads (i.e. resistance furnaces...) and generally for controlling power circuits up to 690 V AC and 220 V DC.

These contactors are of the block type design with:

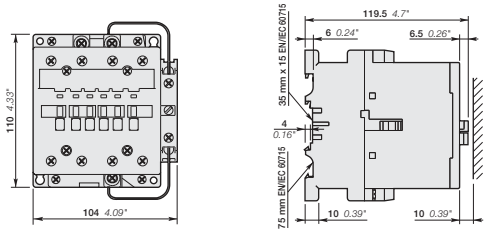
– 4 main poles
– control circuit: DC operated with double winding coil (and factory-mounted lagging contact for "holding" winding insertion)
– add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

Ordering details

IEC	UL/CSA	Rated control circuit voltage Uc (1)	Auxiliary contacts fitted	Type	Order code		Weight
Rated operational current θ ≤ 40 °C AC-1	General use rating 600 V AC						Pkg (1 pce)
A	A	V DC					kg
4 N.O. main poles							
70	80	12	0 0	AE45-40-00	1SBL339201R8000		1.430
		24	0 0	AE45-40-00	1SBL339201R8100		1.430
		48	0 0	AE45-40-00	1SBL339201R8300		1.430
		60	0 0	AE45-40-00	1SBL339201R8400		1.430
		110	0 0	AE45-40-00	1SBL339201R8600		1.430
		125	0 0	AE45-40-00	1SBL339201R8700		1.430
		220	0 0	AE45-40-00	1SBL339201R8800		1.430
		240	0 0	AE45-40-00	1SBL339201R8900		1.430
100	80	12	0 0	AE50-40-00	1SBL359201R8000		1.430
		24	0 0	AE50-40-00	1SBL359201R8100		1.430
		48	0 0	AE50-40-00	1SBL359201R8300		1.430
		60	0 0	AE50-40-00	1SBL359201R8400		1.430
		110	0 0	AE50-40-00	1SBL359201R8600		1.430
		125	0 0	AE50-40-00	1SBL359201R8700		1.430
		220	0 0	AE50-40-00	1SBL359201R8800		1.430
		240	0 0	AE50-40-00	1SBL359201R8900		1.430
125	105	12	0 0	AE75-40-00	1SBL419201R8000		1.430
		24	0 0	AE75-40-00	1SBL419201R8100		1.430
		48	0 0	AE75-40-00	1SBL419201R8300		1.430
		60	0 0	AE75-40-00	1SBL419201R8400		1.430
		110	0 0	AE75-40-00	1SBL419201R8600		1.430
		125	0 0	AE75-40-00	1SBL419201R8700		1.430
		220	0 0	AE75-40-00	1SBL419201R8800		1.430
		240	0 0	AE75-40-00	1SBL419201R8900		1.430
2 N.O. + 2 N.C. main poles (2)							
70	80	12	0 0	AE45-22-00	1SBL339501R8000		1.440
		24	0 0	AE45-22-00	1SBL339501R8100		1.440
		48	0 0	AE45-22-00	1SBL339501R8300		1.440
		60	0 0	AE45-22-00	1SBL339501R8400		1.440
		110	0 0	AE45-22-00	1SBL339501R8600		1.440
		125	0 0	AE45-22-00	1SBL339501R8700		1.440
		220	0 0	AE45-22-00	1SBL339501R8800		1.440
		240	0 0	AE45-22-00	1SBL339501R8900		1.440
125	105	12	0 0	AE75-22-00	1SBL419501R8000		1.440
		24	0 0	AE75-22-00	1SBL419501R8100		1.440
		48	0 0	AE75-22-00	1SBL419501R8300		1.440
		60	0 0	AE75-22-00	1SBL419501R8400		1.440
		110	0 0	AE75-22-00	1SBL419501R8600		1.440
		125	0 0	AE75-22-00	1SBL419501R8700		1.440
		220	0 0	AE75-22-00	1SBL419501R8800		1.440
		240	0 0	AE75-22-00	1SBL419501R8900		1.440

(1) Other control voltages see voltage code table.
(2) These contactors are not suitable for a reversing starter or star-delta starter or for controlling a single load from 2 separate supplies. Please see technical data.

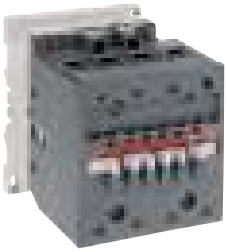
Main dimensions mm, *inches*



AE45, AE50, AE75 4-pole

1SBC101378S0201

AF45 ... AF75 4-pole contactors
70 to 125 A AC-1
AC / DC operated



AF45-40-00

Description

AF45 ... AF75 4-pole contactors are mainly used for controlling non-inductive or slightly inductive loads (i.e. resistance furnaces...) and generally for controlling power circuits up to 690 V AC and 220 V DC.

These contactors are of the block type design with:

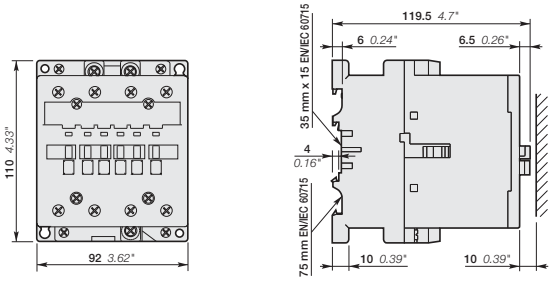
– 4 main poles
– control circuit: AC or DC operated with electronic coil interface accepting a wide control voltage range (e.g. 100...250 V AC and DC)
  - can manage large control voltage variations
  - only 3 coils to cover control voltages between 48...250 V 50/60 Hz and 20...250 V DC
  - reduced panel energy consumption
  - very distinct closing and opening
  - can withstand short voltage dips and voltage sags (SEMI F47 conditions of use on request).
– built-in surge suppression
– add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

Ordering details

IEC	UL/CSA	Rated control circuit voltage Uc min. ... Uc max.		Auxiliary contacts fitted		Type	Order code		Weight
Rated operational current θ ≤ 40 °C AC-1	General use rating 600 V AC								Pkg (1 pce)
A	A	V 50/60 Hz	V DC						kg
4 N.O. main poles									
70	80	-	20...60	0	0	AF45-40-00	1SBL337201R7200 (1)		1.420
		48...130	48...130	0	0	AF45-40-00	1SBL337201R6900		1.420
		100...250	100...250	0	0	AF45-40-00	1SBL337201R7000		1.420
100	80	-	20...60	0	0	AF50-40-00	1SBL357201R7200 (1)		1.420
		48...130	48...130	0	0	AF50-40-00	1SBL357201R6900		1.420
		100...250	100...250	0	0	AF50-40-00	1SBL357201R7000		1.420
125	105	-	20...60	0	0	AF75-40-00	1SBL417201R7200 (1)		1.420
		48...130	48...130	0	0	AF75-40-00	1SBL417201R6900		1.420
		100...250	100...250	0	0	AF75-40-00	1SBL417201R7000		1.420
2 N.O. + 2 N.C. main poles (2)									
70	80	-	20...60	0	0	AF45-22-00	1SBL337501R7200 (1)		1.420
		48...130	48...130	0	0	AF45-22-00	1SBL337501R6900		1.420
		100...250	100...250	0	0	AF45-22-00	1SBL337501R7000		1.420
125	105	-	20...60	0	0	AF75-22-00	1SBL417501R7200 (1)		1.420
		48...130	48...130	0	0	AF75-22-00	1SBL417501R6900		1.420
		100...250	100...250	0	0	AF75-22-00	1SBL417501R7000		1.420

(1) The connection polarities indicated close to the coil terminals must be respected: A1 for the positive pole and A2 for the negative pole.
(2) These contactors are not suitable for a reversing starter or star-delta starter or for controlling a single load from 2 separate supplies. Please see technical data.

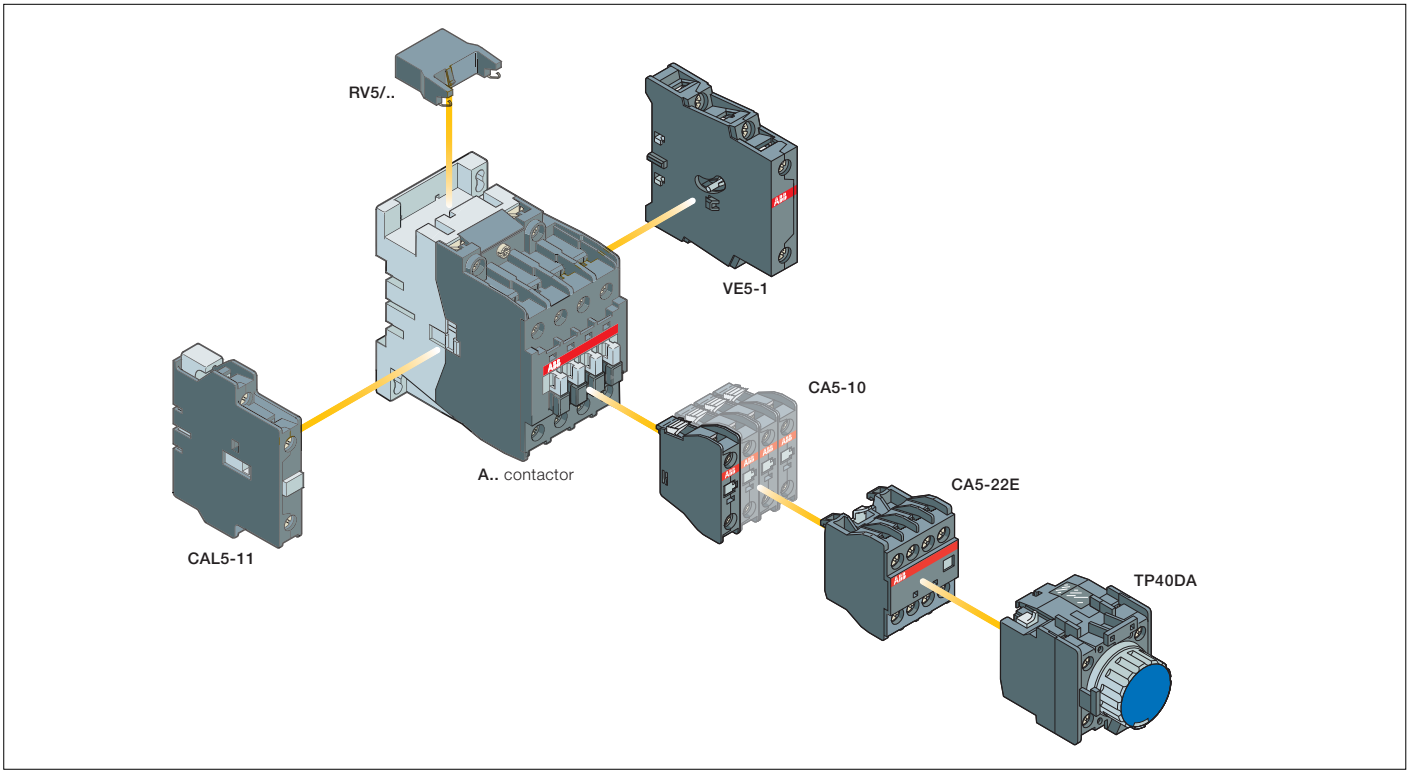
Main dimensions mm, *inches*



AF45, AF50, AF75 4-pole

A45 … A75, AE and AF45 … AF75 4-pole contactors
Main accessories

Contactor and main accessories (other accessories available)



Main accessory fitting details

Many configurations of accessories are possible depending on whether these are front-mounted or side-mounted.

Contactor types	Main poles	Available auxiliary contacts	Front-mounted accessories							Side-mounted accessories		
			Auxiliary contact blocks					Pneumatic timer		Auxiliary contact blocks		Interlock unit
			1-pole CA5-..		4-pole CA5-..			TP.. A		2-pole CAL5-11		VE5-..
A45 ... A75	4 0	0 0	1 to 6 x CA5-..	or	1 x CA5-.. (4-pole) + 2 x 1-pole CA5-..	or		1 x TP .. A + 2 x CA5-.. (1-pole)	+	1 to 2 x CAL5-11	or	1 x VE5-2 + 1 x CAL5-11
	2 2	0 0 (1)	1 to 6 x CA5-..	or	1 x CA5-.. (4-pole) + 2 x 1-pole CA5-..	or		1 x TP .. A + 2 x CA5-.. (1-pole)	+	1 to 2 x CAL5-11		–
AE45 ... AE75	4 0	0 0	1 to 6 x CA5-..	or	1 x CA5-.. (4-pole) + 2 x 1-pole CA5-..	or		1 x TP .. A + 2 x CA5-.. (1-pole)	+	1 x CAL5-11	or	1 x VE5-2
	2 2	0 0 (1)	1 to 6 x CA5-..	or	1 x CA5-.. (4-pole) + 2 x 1-pole CA5-..	or		1 x TP .. A + 2 x CA5-.. (1-pole)	+	1 x CAL5-11		–
AF50 ... AF75	4 0	0 0	1 to 6 x CA5-..	or	1 x CA5-.. (4-pole) + 2 x 1-pole CA5-..	or		1 x TP .. A + 2 x CA5-.. (1-pole)	+	1 to 2 x CAL5-11	or	1 x VE5-2 + 1 x CAL5-11
	2 2	0 0 (1)	1 to 6 x CA5-..	or	1 x CA5-.. (4-pole) + 2 x 1-pole CA5-..	or		1 x TP .. A + 2 x CA5-.. (1-pole)	+	1 to 2 x CAL5-11		–

(1) 2 x N.C. CA 5-.. auxiliary contacts maximum.

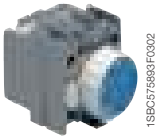
1SBC101394S0201

A45 … A75, AE and AF50 … AF75 4-pole contactors
Main accessories

CA5-10

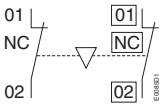
CAL5-11

RV5/50

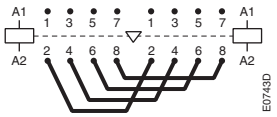


TP40DA

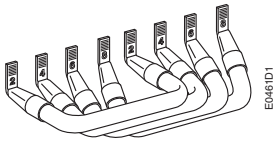
BX-TP



VE5-2
Terminal marking and positioning



BES... for 4 N.O. main pole connection



BES75-40

Ordering details (1)

For contactors	Auxiliary contacts	Type	Order code		Pkg qty	Weight (1 pce) kg
Front-mounted instantaneous auxiliary contact blocks						
A45 ... A75, AE45 ... AE75, AF50 ... AF75	1 –	CA5-10	1SBN010010R1010		10	0.014
	– 1	CA5-01	1SBN010010R1001		10	0.014
A45 ... A75, AE45 ... AE75, AF45 ... AF75	2 2	CA5-22E	1SBN010040R1022		2	0.060
Side-mounted instantaneous auxiliary contact blocks						
A45 ... A75, AE45 ... AE75, AF45 ... AF75	1 1	CAL5-11	1SBN010020R1011		2	0.050
Pneumatic timer blocks						
A45 ... A75, AE45 ... AE75, AF45 ... AF75	delay on energization 0.1...40 s	1 1	TP40DA	1SBN020300R1000		1	0.070
	delay on energization 10...180 s	1 1	TP180DA	1SBN020300R1001		1	0.070
	delay on de-energization 0.1...40 s	1 1	TP40IA	1SBN020301R1000		1	0.070
	delay on de-energization 10...180 s	1 1	TP180IA	1SBN020301R1001		1	0.070
Timer accessory	plastic sealable cover	– –	BX-TP	FPTN472657R0001		1	0.006
Interlock unit						
A45 ... A75-40-00, AF45 ... AF75-40-00	Mechanical and electrical	– 2	VE5-2	1SBN030210R1000		1	0.146

Surge suppressors

For contactors	Rated control circuit voltage Uc V	AC	DC	Type	Order code		Pkg qty	Weight (1 pce) kg
A45 ... A75, AE45 ... AE75	24...50	●	●	RV5/50	1SBN050010R1000		2	0.015
	50...133	●	●	RV5/133	1SBN050010R1001		2	0.015
	110...250	●	●	RV5/250	1SBN050010R1002		2	0.015
	250...440	●	●	RV5/440	1SBN050010R1003		2	0.015
A45 ... A75	24...50	●	–	RC5-2/50	1SBN050200R1000		2	0.015
	50...133	●	–	RC5-2/133	1SBN050200R1001		2	0.015
	110...250	●	–	RC5-2/250	1SBN050200R1002		2	0.015
	250...440	●	–	RC5-2/440	1SBN050200R1003		2	0.015
AE45 ... AE75	12...32	–	●	RT5/32	1SBN050020R1000		2	0.015
	25...65	–	●	RT5/65	1SBN050020R1001		2	0.015
	50...90	–	●	RT5/90	1SBN050020R1002		2	0.015
	77...150	–	●	RT5/150	1SBN050020R1003		2	0.015
	150...264	–	●	RT5/264	1SBN050020R1004		2	0.015

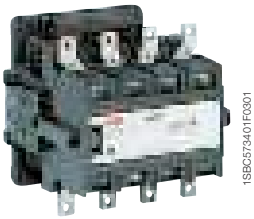
Connection sets for 4-pole changeover contactors

A45 ... A75-40-00, AE45 ... AE75-40-00, AF45 ... AF75-40-00	BES75-40	1SBN083302R1000		1	0.400

(1) See "Main accessory fitting details" table.

5

EK110 ... EK150 4-pole contactors
200 to 250 A AC-1
AC operated - with 1 N.O. + 1 N.C. auxiliary contacts



EK150-40-11

Description

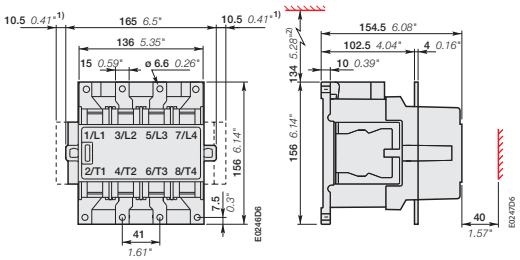
EK110 ... EK150 4-pole contactors are mainly used for controlling non-inductive or slightly inductive loads (i.e. resistance furnaces...) and for controlling power circuits up to 1000 V AC and 440 V DC.
These contactors are of the block type design with:
– 4 main poles
– control circuit: AC operated
– add-on auxiliary contact blocks for side mounting and a wide range of accessories.

Ordering details

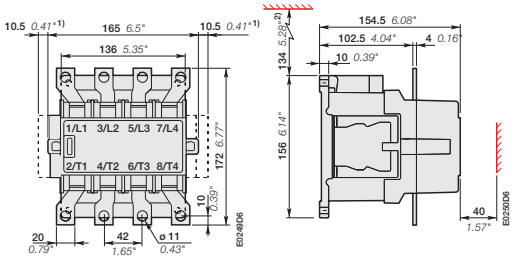
IEC Rated operational current θ ≤ 40 °C AC-1 A	UL/CSA General use rating 600 V AC A	Rated control circuit voltage Uc (1) V 50 Hz	 V 60 Hz	Auxiliary contacts fitted		Type	Order code		Weight Pkg (1 pce) kg
200	170	48	-	1	1	EK110-40-11	SK824440-AD		4.300
		-	110	1	1	EK110-40-11	SK824440-AE		4.300
		110	120	1	1	EK110-40-11	SK824440-AF		4.300
		220...230	-	1	1	EK110-40-11	SK824440-AL		4.300
		230...240	-	1	1	EK110-40-11	SK824440-AM		4.300
		-	380	1	1	EK110-40-11	SK824440-AN		4.300
		380...400	440	1	1	EK110-40-11	SK824440-AP		4.300
		400...415	-	1	1	EK110-40-11	SK824440-AR		4.300
250	200	48	-	1	1	EK150-40-11	SK824441-AD		4.350
		-	110	1	1	EK150-40-11	SK824441-AE		4.350
		110	120	1	1	EK150-40-11	SK824441-AF		4.350
		220...230	-	1	1	EK150-40-11	SK824441-AL		4.350
		230...240	-	1	1	EK150-40-11	SK824441-AM		4.350
		-	380	1	1	EK150-40-11	SK824441-AN		4.350
		380...400	440	1	1	EK150-40-11	SK824441-AP		4.350
		400...415	-	1	1	EK150-40-11	SK824441-AR		4.350

(1) Other control voltages see voltage code table.

Main dimensions mm, *inches*



EK110

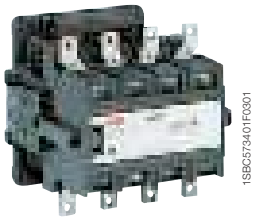


EK150

1) Dimension for extra auxiliary contact block.
2) Min. distance to uninsulated wall.

1SFC101017C0201

EK110 ... EK150 4-pole contactors
200 to 250 A AC-1
DC operated - with 2 N.O. + 1 N.C. auxiliary contacts



EK150-40-21

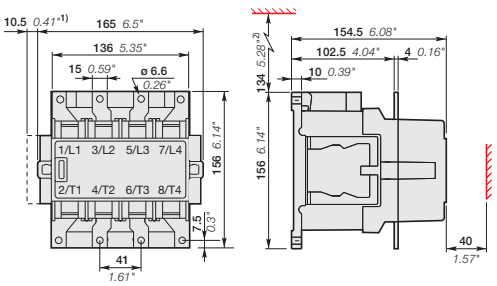
Description

EK110 ... EK150 4-pole contactors are mainly used for controlling non-inductive or slightly inductive loads (i.e. resistance furnaces...) and for controlling power circuits up to 1000 V AC and 440 V DC.
These contactors are of the block type design with:
– 4 main poles
– control circuit: DC operated
– add-on auxiliary contact blocks for side mounting and a wide range of accessories.

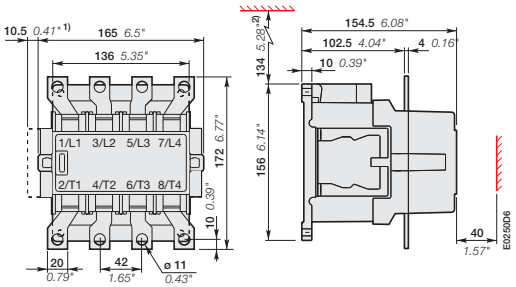
Ordering details

IEC Rated operational current θ ≤ 40 °C AC-1 A	UL/CSA General use rating 600 V AC A	Rated control circuit voltage Uc V DC	Auxiliary contacts fitted	Type	Order code	Weight Pkg (1 pce) kg
200	170	12	2 1	EK110-40-21	SK824440-DA	4.350
		24	2 1	EK110-40-21	SK824440-DB	4.350
		36	2 1	EK110-40-21	SK824440-DC	4.350
		48	2 1	EK110-40-21	SK824440-DD	4.350
		60	2 1	EK110-40-21	SK824440-DT	4.350
		75	2 1	EK110-40-21	SK824440-DG	4.350
		110	2 1	EK110-40-21	SK824440-DE	4.350
		125	2 1	EK110-40-21	SK824440-DU	4.350
		220	2 1	EK110-40-21	SK824440-DF	4.350
250	200	12	2 1	EK150-40-21	SK824441-DA	4.400
		24	2 1	EK150-40-21	SK824441-DB	4.400
		36	2 1	EK150-40-21	SK824441-DC	4.400
		48	2 1	EK150-40-21	SK824441-DD	4.400
		60	2 1	EK150-40-21	SK824441-DT	4.400
		75	2 1	EK150-40-21	SK824441-DG	4.400
		110	2 1	EK150-40-21	SK824441-DE	4.400
		125	2 1	EK150-40-21	SK824441-DU	4.400
		220	2 1	EK150-40-21	SK824441-DF	4.400

Main dimensions mm, *inches*



EK110



EK150

1) Dimension for extra auxiliary contact block.
2) Min. distance to uninsulated wall.

1SFC101061C0201

EK175 ... EK550 4-pole contactors
300 to 800 A AC-1
AC operated - with 1 N.O. + 1 N.C. auxiliary contacts

EK370-40-11

Description

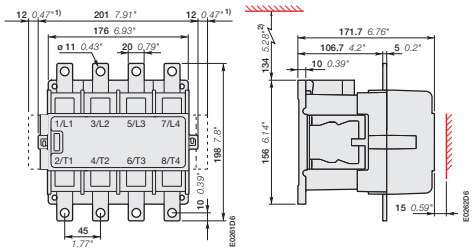
EK175 ... EK550 4-pole contactors are mainly used for controlling non-inductive or slightly inductive loads (i.e. resistance furnaces...) and for controlling power circuits up to 1000 V AC and 600 V DC.
These contactors are of the block type design with:
– 4 main poles
– control circuit: AC operated
– add-on auxiliary contact blocks for side mounting and a wide range of accessories.

Ordering details

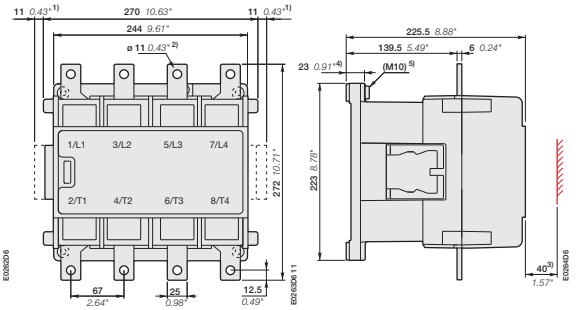
IEC	UL/CSA	Rated control circuit voltage Uc (1)		Auxiliary contacts fitted		Type	Order code		Weight
Rated operational current θ ≤ 40 °C AC-1	General use rating 600 V AC								Pkg (1 pce)
A	A	V 50 Hz	V 60 Hz						kg
300	250	48	-	1	1	EK175-40-11	SK825440-AD		6.600
		-	110	1	1	EK175-40-11	SK825440-AE		6.600
		110	120	1	1	EK175-40-11	SK825440-AF		6.600
		220...230	-	1	1	EK175-40-11	SK825440-AL		6.600
		230...240	-	1	1	EK175-40-11	SK825440-AM		6.600
		-	380	1	1	EK175-40-11	SK825440-AN		6.600
		380...400	440	1	1	EK175-40-11	SK825440-AP		6.600
		400...415	-	1	1	EK175-40-11	SK825440-AR		6.600
350	300	48	-	1	1	EK210-40-11	SK825441-AD		6.600
		-	110	1	1	EK210-40-11	SK825441-AE		6.600
		110	120	1	1	EK210-40-11	SK825441-AF		6.600
		220...230	-	1	1	EK210-40-11	SK825441-AL		6.600
		230...240	-	1	1	EK210-40-11	SK825441-AM		6.600
		-	380	1	1	EK210-40-11	SK825441-AN		6.600
		380...400	440	1	1	EK210-40-11	SK825441-AP		6.600
		400...415	-	1	1	EK210-40-11	SK825441-AR		6.600
550	420	48	-	1	1	EK370-40-11	SK827040-AD		17.200
		110	110...120	1	1	EK370-40-11	SK827040-EF		17.200
		110...115	115...127	1	1	EK370-40-11	SK827040-EG		17.200
		220	220...240	1	1	EK370-40-11	SK827040-EL		17.200
		220...230	230...255	1	1	EK370-40-11	SK827040-EM		17.200
		380	380...415	1	1	EK370-40-11	SK827040-EP		17.200
		380...400	400...440	1	1	EK370-40-11	SK827040-ER		17.200
		400...415	-	1	1	EK370-40-11	SK827040-AR		17.200
800	540	48	-	1	1	EK550-40-11	SK827041-AD		17.200
		110	110...120	1	1	EK550-40-11	SK827041-EF		17.200
		110...115	115...127	1	1	EK550-40-11	SK827041-EG		17.200
		220	220...240	1	1	EK550-40-11	SK827041-EL		17.200
		220...230	230...255	1	1	EK550-40-11	SK827041-EM		17.200
		380	380...415	1	1	EK550-40-11	SK827041-EP		17.200
		380...400	400...440	1	1	EK550-40-11	SK827041-ER		17.200
		400...415	-	1	1	EK550-40-11	SK827041-AR		17.200

(1) Other control voltages see voltage code table.

Main dimensions mm, *inches*



EK175, EK210
1) Dimension for extra auxiliary contact block.
2) Min. distance to uninsulated wall.



EK370, EK550
1) Dimension for extra auxiliary contact block.
2) Screw, nut and washer by-packed.
3) Min. distance to uninsulated wall.
4) Damping elements are included.
5) Earthing screw.

1SFC101019C0201

EK175 ... EK550 4-pole contactors
300 to 800 A AC-1
DC operated - with 2 N.O. + 1 N.C. auxiliary contacts

EK370-40-21

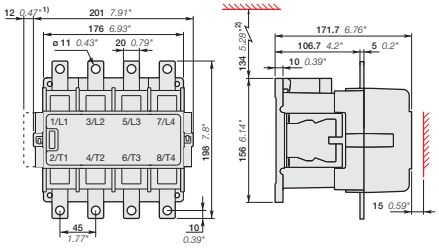
Description

EK175 ... EK550 4-pole contactors are mainly used for controlling non-inductive or slightly inductive loads (i.e. resistance furnaces...) and generally for controlling power circuits up to 1000 V AC and 600 V DC.
These contactors are of the block type design with:
– 4 main poles
– control circuit: DC operated with
– add-on auxiliary contact blocks for side mounting and a wide range of accessories.

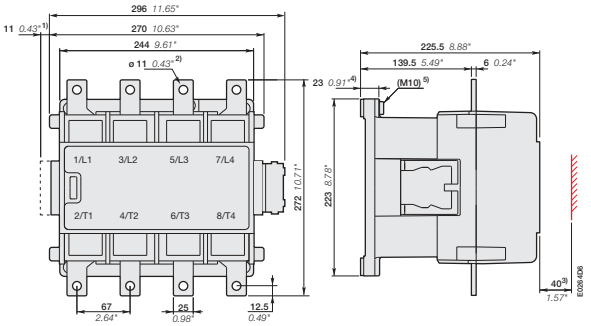
Ordering details

IEC Rated operational current θ ≤ 40 °C AC-1 A	UL/CSA General use rating 600 V AC A	Rated control circuit voltage Uc V DC	Auxiliary contacts fitted	Type	Order code	Weight Pkg (1 pce) kg
300	250	12	2 1	EK175-40-21	SK825440-DA	6.650
		24	2 1	EK175-40-21	SK825440-DB	6.650
		36	2 1	EK175-40-21	SK825440-DC	6.650
		48	2 1	EK175-40-21	SK825440-DD	6.650
		60	2 1	EK175-40-21	SK825440-DT	6.650
		75	2 1	EK175-40-21	SK825440-DG	6.650
		110	2 1	EK175-40-21	SK825440-DE	6.650
		125	2 1	EK175-40-21	SK825440-DU	6.650
		220	2 1	EK175-40-21	SK825440-DF	6.650
350	300	12	2 1	EK210-40-21	SK825441-DA	6.650
		24	2 1	EK210-40-21	SK825441-DB	6.650
		36	2 1	EK210-40-21	SK825441-DC	6.650
		48	2 1	EK210-40-21	SK825441-DD	6.650
		60	2 1	EK210-40-21	SK825441-DT	6.650
		75	2 1	EK210-40-21	SK825441-DG	6.650
		110	2 1	EK210-40-21	SK825441-DE	6.650
		125	2 1	EK210-40-21	SK825441-DU	6.650
		220	2 1	EK210-40-21	SK825441-DF	6.650
550	420	24	2 1	EK370-40-21	SK827040-DB	17.200
		36	2 1	EK370-40-21	SK827040-DC	17.200
		48	2 1	EK370-40-21	SK827040-DD	17.200
		60	2 1	EK370-40-21	SK827040-DT	17.200
		75	2 1	EK370-40-21	SK827040-DG	17.200
		110	2 1	EK370-40-21	SK827040-DE	17.200
		125	2 1	EK370-40-21	SK827040-DU	17.200
		220	2 1	EK370-40-21	SK827040-DF	17.200
800	540	24	2 1	EK550-40-21	SK827041-DB	17.200
		36	2 1	EK550-40-21	SK827041-DC	17.200
		48	2 1	EK550-40-21	SK827041-DD	17.200
		60	2 1	EK550-40-21	SK827041-DT	17.200
		75	2 1	EK550-40-21	SK827041-DG	17.200
		110	2 1	EK550-40-21	SK827041-DE	17.200
		125	2 1	EK550-40-21	SK827041-DU	17.200
		220	2 1	EK550-40-21	SK827041-DF	17.200

Main dimensions mm, *inches*



EK175 ... EK210
1) Dimension for extra auxiliary contact block.
2) Min. distance to uninsulated wall.



EK370 ... EK550
1) Dimension for extra auxiliary contact block.
2) Screw, nut and washer by-packed.
3) Min. distance to uninsulated wall.
4) Damping elements are included.
5) Earthing screw.

1SFC101062C0201

EK1000 4-pole contactors
1000 A AC-1
AC operated - with 1 N.O. + 1 N.C. auxiliary contacts

EK1000-40-11

Description

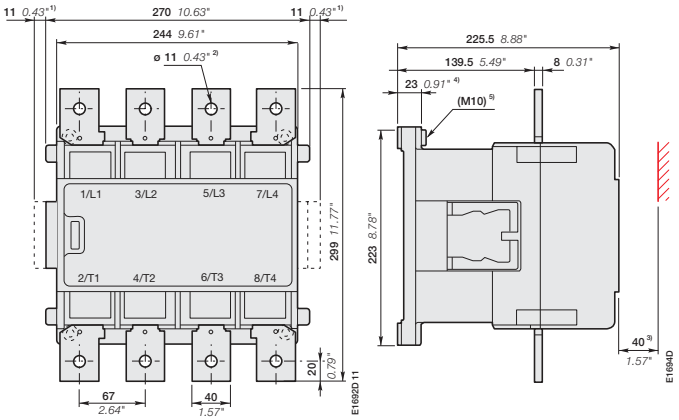
EK1000 4-pole contactors are mainly used for controlling non-inductive or slightly inductive loads (i.e. resistance furnaces...) and generally for controlling power circuits up to 1000 V AC.
These contactors are of the block type design with:
– 4 main poles
– control circuit: AC operated
– add-on auxiliary contact blocks for side mounting and a wide range of accessories.

Ordering details

IEC	UL/CSA	Rated control circuit voltage Uc (1)		Auxiliary contacts fitted		Type	Order code		Weight
Rated operational current θ ≤ 40 °C AC-1	General use rating 600 V AC								Pkg (1 pce)
A	A	V 50 Hz	V 60 Hz						kg
1000	-	48	-	1	1	EK1000-40-11	SK827044-AD		17.500
		110	110...120	1	1	EK1000-40-11	SK827044-EF		17.500
		110...115	115...127	1	1	EK1000-40-11	SK827044-EG		17.500
		220	220...240	1	1	EK1000-40-11	SK827044-EL		17.500
		220...230	230...255	1	1	EK1000-40-11	SK827044-EM		17.500
		380	380...415	1	1	EK1000-40-11	SK827044-EP		17.500
		380...400	400...440	1	1	EK1000-40-11	SK827044-ER		17.500
		400...415	-	1	1	EK1000-40-11	SK827044-AR		17.500

(1) Other control voltages see voltage code table.

Main dimensions mm, *inches*



EK1000
1) Dimension for extra auxiliary contact block.
2) Screw, nut and washer by-packed.
3) Min. distance to uninsulated wall.
4) Damping elements are included.
5) Earthing screw.

1SFC101021C0201

EK1000 4-pole contactors
1000 A AC-1
DC operated - with 2 N.O. + 1 N.C. auxiliary contacts

EK1000-40-21

Description

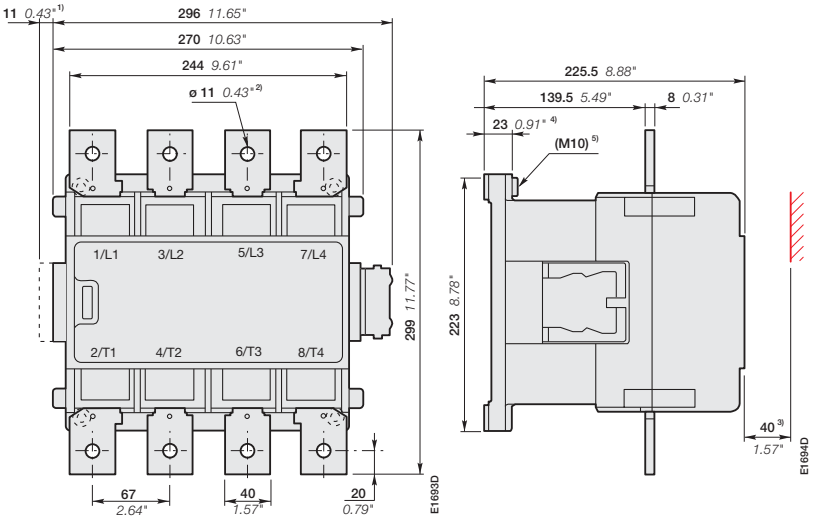
EK1000 4-pole contactors are mainly used for controlling non-inductive or slightly inductive loads (i.e. resistance furnaces...) and generally for controlling power circuits up to 1000 V AC.
These contactors are of the block type design with:
– 4 main poles
– control circuit: DC operated
– add-on auxiliary contact blocks for side mounting and a wide range of accessories.

Ordering details

IEC Rated operational current θ ≤ 40 °C AC-1 A	UL/CSA General use rating 600 V AC A	Rated control circuit voltage Uc V DC	Auxiliary contacts fitted		Type	Order code		Weight Pkg (1 pce) kg
1000	-	24	2	1	EK1000-40-21	SK827044-DB		17.500
		36	2	1	EK1000-40-21	SK827044-DC		17.500
		48	2	1	EK1000-40-21	SK827044-DD		17.500
		60	2	1	EK1000-40-21	SK827044-DT		17.500
		75	2	1	EK1000-40-21	SK827044-DG		17.500
		110	2	1	EK1000-40-21	SK827044-DE		17.500
		125	2	1	EK1000-40-21	SK827044-DU		17.500
		220	2	1	EK1000-40-21	SK827044-DF		17.500

5

Main dimensions mm, *inches*



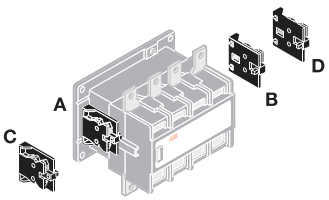
EK1000
1) Dimension for extra auxiliary contact block.
2) Screw, nut and washer by-packed.
3) Min. distance to uninsulated wall.
4) Damping elements are included.
5) Earthing screw.

1SFC101063C0201

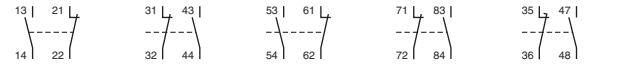
EK110 ... EK1000 4-pole contactors
with 1 N.O. + 1 N.C. auxiliary contacts
and 2 N.O. + 1 N.C. auxiliary contacts

Main accessory fitting details

Mounting positions of the auxiliary contact



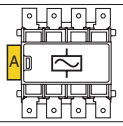
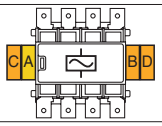
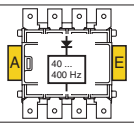
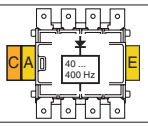
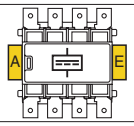
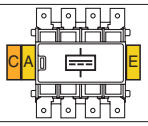
Auxiliary contact types and connecting diagrams



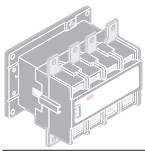
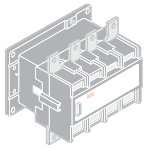
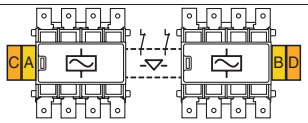
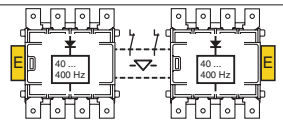
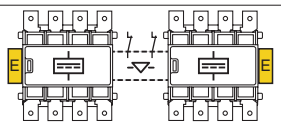
CAL16-11 A | CAL16-11 B | CAL16-11 C | CAL16-11 D | CCL16-11 E (1)

(1) Contact 35-36 used for some types of EK... contactors

EK... 4-pole contactors

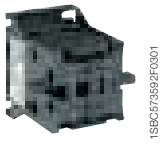
Contactor types	Main poles	Available auxiliary contacts		Add-on auxiliary contact blocks 2-pole CAL16-11 ...	Mounting and positioning (Factory mounted auxiliary contacts / Add-on CAL16-11 auxiliary contacts)
AC operated, 50 Hz, 60 Hz or 50/60 Hz					
EK110 ... EK1000	4 0	1 1		+ 1 x CAL16-11B + 1 x CAL16-11C + 1 x CAL16-11D	
AC operated, 40...400 Hz					
EK110 ... EK210	4 0	2 1		+ 1 x CAL16-11C	
DC operated					
EK110 ... EK1000	4 0	2 1		+ 1 x CAL16-11C	

EK ... 4-pole reversing contactors with VH145 / VH300 mechanical and electrical interlock units

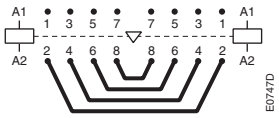
"Left hand" contactors	Interlocking	"Right hand" contactors		Add-on auxiliary contact blocks 2-pole CAL16-11 ...	Mounting and positioning (Factory mounted auxiliary contacts / Add-on CAL16-11 auxiliary contacts)
					
AC operated, 50 Hz, 60 Hz or 50/60 Hz					
EK110 ... EK150 EK175, EK210 EK370 ... EK1000	VH145 VH300 VH800	EK110, EK150 EK175, EK210 EK370 ... EK1000	+	1 x CAL16-11C 1 x CAL16-11D	
AC operated, 40...400 Hz					
EK110 ... EK150 EK175, EK210 EK370 ... EK1000	VH145 VH300 VH800	EK110, EK150 EK175, EK210 EK370 ... EK1000		–	
DC operated, 50 Hz, 60 Hz or 50/60 Hz					
EK110 ... EK150 EK175, EK210 EK370 ... EK1000	VH145 VH300 VH800	EK110, EK150 EK175, EK210 EK370 ... EK1000		–	

1SFC101080C0201

EK110 ... EK1000 4-pole contactors
with 1 N.O. + 1 N.C. auxiliary contacts and 2 N.O. + 1 N.C. auxiliary contacts



VH145



BSS100 ... BSS100

RC-EH300/48

Ordering details (1)

For contactors	Auxiliary contacts		Type	Order code		Pkg qty	Weight (1 pce) kg
Side-mounted auxiliary contact blocks							
EK...	1	1	CAL16-11B	SK829002-B		1	0.050
	1	1	CAL16-11C	SK829002-C		1	0.050
	1	1	CAL16-11D	SK829002-D		1	0.050
	1	1	CCL16-11E (2)	SK829002-E		1	0.050
Mechanical and electrical interlock unit for two horizontal mounted contactors							
EK110, EK150			VH145	SK829071-A		1	0.130
EK175, EK210			VH300	SK829071-B		1	0.130
Mechanical interlock unit for two horizontal mounted contactors							
EK370 ... EK1000			VH800	SK829070-F		1	6.000
Connecting sets							
EK110			BSS100	SK829090-B		1	0.400
EK150			BSS145	SK829090-F		1	0.700
EK175, EK210			BSS210	SK829090-G		1	1.000
EK370, EK550			BSS550	SK829090-E		1	3.300
EK1000			BSS1000	SK829090-H		1	5.500

(2) Mounting of CCL16-11E blocks does not allow an additional second block to be added on top of it.
All DC operated EK... contactors are equipped with one CCL16-11E on the right side.

Surge suppressors

For contactors	Rated control circuit voltage Uc V	AC	DC	Type	Order code		Pkg qty	Weight (1 pce) kg
EK110 ... EK210	24...48	●	–	RC-EH300/48	SK829007-A		1	0.015
	110...415	●	–	RC-EH300/415	SK829007-B		1	0.015
EK370 ... EK1000	48...110	●	–	RC-EH800/110	SK829007-C		1	0.015
EK110 ... EK1000	24...125	–	●	RC-EH800/110	SK829007-C		1	0.015
EK370 ... EK1000	220...600	●	–	RC-EH800/600	SK829007-D		1	0.015

(1) See "Main accessory fitting details" table.

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AF09 ... AF38 4-pole contactors
Technical data

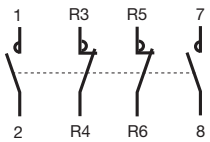
Main pole - Utilization characteristics according to IEC

Contactor types	AC / DC operated	AF09	AF16	AF26	AF38
Standards		IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1			
Rated operational voltage Ue max.		690 V			
Rated frequency (without derating)		50 / 60 Hz			
Conventional free-air thermal current Ith					
acc. to IEC 60947-4-1, open contactors, θ ≤ 40 °C		35 A	35 A	55 A	55 A
With conductor cross-sectional area		6 mm²	6 mm²	16 mm²	16 mm²
AC-1 Utilization category					
For air temperature close to contactor					
Ie / Rated operational current AC-1	**θ ≤ 40 °C**	25 A	30 A	45 A	55 A
Ue max. ≤ 690 V, 50/60 Hz	**θ ≤ 60 °C**	25 A	30 A	40 A	45 A
	θ ≤ 70 °C	22 A	26 A	32 A	37 A
With conductor cross-sectional area		4 mm²	6 mm²	10 mm²	16 mm²
Short-circuit protection device for contactors					
Without thermal overload relay - Motor protection excluded					
Ue ≤ 500 V AC - gG type fuse		25 A	32 A	50 A	63 A
Rated short-time withstand current Icw	**1 s**	300 A	300 A	450 A	450 A
At 40 °C ambient temperature,	**10 s**	150 A	150 A	300 A	300 A
in free air from a cold state	**30 s**	80 A	80 A	225 A	225 A
	1 min	60 A	60 A	150 A	150 A
	15 min	35 A	35 A	55 A	55 A
Power dissipation per pole	**Ie / AC-1**	0.8 W	1.2 W	1.6 W	2.3 W
Max. electrical switching frequency	**AC-1**	600 cycles/h			

Main pole - Utilization characteristics according to UL / CSA

Contactor types	AF09	AF16	AF26	AF38
Standards	UL 508, CSA C22.2 N°14			
Max. operational voltage	600 V			
UL / CSA general use rating				
600 V AC	25 A	30 A	45 A	55 A
With conductor cross-sectional area	AWG 10	AWG 10	AWG 8	AWG 6
Max. electrical switching frequency				
For general use	600 cycles/h			

Remark for 4-pole contactors fitted with 2 N.O. + 2 N.C. main poles

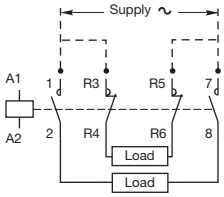


These contactors are suitable for controlling 2 separate circuits, i.e. 2 loads with 2 separate supplies, or 1 circuit comprising 2 separate loads with a single supply (see diagrams below). When the contactor operates there is no mechanical overlapping between the N.O. poles and the N.C. poles: BREAK before MAKE.

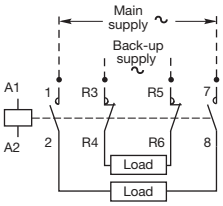
These contactors are not suitable for a reversing starter or for controlling a single load from 2 separate supplies.

Block diagrams

– Single supply and 2 separate loads



– 2 separate supplies and 2 separate loads



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A45 ... A75, AE, TAE and AF45 ... AF75 4-pole contactors
Technical data

Main pole - Utilization characteristics according to IEC

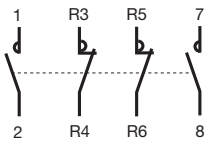
Contactor types				
	AC operated	A45	A50	A75
	DC operated	AE45	AE50	AE75
		TAE45	TAE50	TAE75
	AC / DC operated	AF45	AF50	AF75
Standards		IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1		
Rated operational voltage Ue max.		1000 V (690 V for AF.. contactors)		
Rated frequency (without derating)		50 / 60 Hz		
Conventional free-air thermal current Ith				
acc. to IEC 60947-4-1, open contactors, θ ≤ 40 °C		100 A	100 A	125 A
With conductor cross-sectional area		35 mm²	35 mm²	50 mm²
AC-1 Utilization category				
For air temperature close to contactor				
Ie / Rated operational current AC-1	**θ ≤ 40 °C**	70 A	100 A	125 A
Ue max. ≤ 690 V, 50/60 Hz	**θ ≤ 55 °C**	60 A	85 A	105 A
	θ ≤ 70 °C (1)	50 A	70 A	85 A
With conductor cross-sectional area		25 mm²	35 mm²	50 mm²
Short-circuit protection device for contactors				
without thermal overload relay - Motor protection excluded				
Ue ≤ 500 V AC - gG type fuse		80 A	100 A	160 A
Rated short-time withstand current Icw	**1 s**	1000 A		
At 40 °C ambient temperature, in free air from a cold state	**10 s**	650 A		
	30 s	370 A		
	1 min	250 A		
	15 min	110 A	110 A	135 A
Power dissipation per pole	**Ie / AC-1**	2.5 W	5 W	7 W
Max. electrical switching frequency	**AC-1**	600 cycles/h (300 for AF.., AE.., TAE..)		

(1) Unauthorized for TAE.. contactors

Main pole - Utilization characteristics according to UL / CSA

Contactor types				
	AC operated	A45	A50	A75
	DC operated	AE45	AE50	AE75
		TAE45	TAE50	TAE75
	AC / DC operated	AF45	AF50	AF75
Standards		UL 508, CSA C22.2 N°14		
Max. operational voltage		600 V		
UL / CSA general use rating				
600 V AC		65 A	80 A	105 A
With conductor cross-sectional area		AWG 6	AWG 4	AWG 2
Max. electrical switching frequency				
For general use		600 cycles/h (300 for AF.., AE.. TAE..)		

Remark for 4-pole contactors fitted with 2 N.O. + 2 N.C. main poles

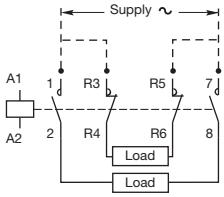


These contactors are suitable for controlling 2 separate circuits, i.e. 2 loads with 2 separate supplies, or 1 circuit comprising 2 separate loads with a single supply (see diagrams below). When the contactor operates there is no mechanical overlapping between the N.O. poles and the N.C. poles: BREAK before MAKE.

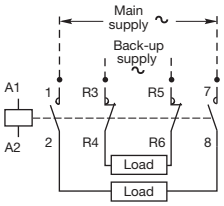
These contactors are not suitable for a reversing starter or for controlling a single load from 2 separate supplies.

Block diagrams

– Single supply and 2 separate loads



– 2 separate supplies and 2 separate loads



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EK110 ... EK1000 4-pole contactors
Technical data

Main pole - Utilization characteristics according to IEC

Contactor types	AC or DC operated	EK110	EK150	EK175	EK210	EK370	EK550	EK1000
Standards		IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1						
Rated operational voltage Ue max.		1000 V						
Rated frequency (without derating)		50 / 60 Hz						
Conventional free-air thermal current Ith								
acc. to IEC 60947-4-1, open contactors, θ ≤ 40 °C		200 A	250 A	300 A	350 A	550 A	800 A	1000 A
With conductor cross-sectional area		95 mm²	150 mm²	185 mm²	240 mm²	2x 185 mm²	2x 240 mm²	2x 300 mm²
AC-1 Utilization category								
For air temperature close to contactor								
Ie / Rated operational current AC-1	**θ ≤ 40 °C**	200 A	250 A	300 A	350 A	550 A	800 A	1000 A
Ue max. ≤ 1000 V, 50/60 Hz	**θ ≤ 55 °C**	180 A	230 A	270 A	310 A	470 A	650 A	800 A
	θ ≤ 70 °C	155 A	200 A	215 A	250 A	400 A	575 A	720 A
With conductor cross-sectional area		95 mm²	150 mm²	185 mm²	240 mm²	2x 185 mm²	2x 240 mm²	2x 300 mm²
AC-3 Utilization category								
For air temperature close to contactor θ ≤ 55 °C								
Ie / Max. rated operational current AC-3 (1)								
	220-230-240 V	120 A	145 A	210 A	210 A	400 A	550 A	-
	380-400 V	120 A	145 A	210 A	210 A	400 A	550 A	-
	415 V	120 A	145 A	210 A	210 A	400 A	550 A	-
3-phase motors	**440 V**	120 A	145 A	210 A	210 A	370 A	550 A	-
	500 V	120 A	145 A	210 A	210 A	370 A	550 A	-
	690 V	120 A	120 A	210 A	210 A	370 A	550 A	-
	1000 V	64 A	80 A	113 A	113 A	155 A	175 A	-
Rated operational power AC-3 (1)								
	220-230-240 V	30 kW	45 kW	59 kW	59 kW	110 kW	160 kW	-
	380-400 V	55 kW	75 kW	110 kW	110 kW	200 kW	280 kW	-
1500 r.p.m. 50 Hz	**415 V**	55 kW	75 kW	110 kW	110 kW	220 kW	315 kW	-
1800 r.p.m. 60 Hz	**440 V**	59 kW	75 kW	110 kW	110 kW	220 kW	315 kW	-
3-phase motors	**500 V**	75 kW	90 kW	132 kW	132 kW	250 kW	400 kW	-
	690 V	110 kW	110 kW	160 kW	160 kW	355 kW	500 kW	-
	1000 V	90 kW	110 kW	160 kW	160 kW	220 kW	250 A	-
Rated making capacity AC-3		10 x Ie AC-3 acc. to IEC 60947-4-1						
Rated breaking capacity AC-3		8 x Ie AC-3 acc. to IEC 60947-4-1						
Short-circuit protection device for contactors								
without thermal overload relay - Motor protection excluded								
Ue ≤ 500 V AC - gG type fuse		250 A	250 A	355 A	355 A	630 A	800 A	1000 A
Rated short-time withstand current Icw	**1 s**	1700 A	1800 A	2300 A	2300 A	5500 A	5500 A	6800 A
at 40 °C ambient temperature,	**10 s**	900 A	1200 A	1680 A	1680 A	5300 A	5300 A	6400 A
in free air from a cold state	**30 s**	600 A	700 A	1000 A	1000 A	3700 A	3700 A	4400 A
	1 min	450 A	550 A	800 A	800 A	3000 A	3000 A	3400 A
	15 min	210 A	250 A	320 A	320 A	1000 A	1000 A	1200 A
Maximum breaking capacity								
cos φ = 0.45	**at 440 V**	1400 A	1500 A	2000 A	2000 A	5000 A	5400 A	-
(cos φ = 0.35 for Ie > 100 A)	**at 690 V**	1100 A	1200 A	1700 A	1700 A	5000 A	5400 A	-
Power dissipation per pole	**Ie / AC-1**	10 W	13 W	18 W	18 W	40 W	60 W	80 W
	Ie / AC-3	3 W	5 W	9 W	9 W	15 W	25 W	-
Max. electrical switching frequency	**AC-1**	300 cycles/h						
	AC-3	300 cycles/h						-
	AC-2, AC-4	150 cycles/h		120 cycles/h				-

Main pole - Utilization characteristics according to UL / CSA

Contactor types	AC or DC operated	EK110	EK150	EK175	EK210	EK370	EK550	EK1000
Standards		UL 508, CSA C22.2 N°14						-
Max. operational voltage		600 V						-
UL / CSA general use rating								
600 V AC		170 A	200 A	250 A	300 A	420 A	540 A	-
Short-circuit protection device for contactors								
without thermal overload relay - Motor protection excluded								
Fuse rating		400 A				1200 A		
Fuse type, 600 V		J				L		
Max. electrical switching frequency								
For general use		300 cycles/h						

(1) For the corresponding kW/A or hp/A values of 1500 r.p.m, 50 Hz or 1800 r.p.m, 60 Hz, 3-phase motors, see "Motor rated operational powers and currents".

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AF09 ... AF38 4-pole contactors
Technical data

Magnet system characteristics

Contactor types		AC / DC operated	AF09	AF16	AF26	AF38
Coil operating limits acc. to IEC 60947-4-1		**AC supply**	At θ ≤ 60 °C 0.85 x Uc min...1.1 x Uc max. At θ ≤ 70 °C 0.85 x Uc min...Uc max.			
		DC supply	At θ ≤ 60 °C 0.85 x Uc min...1.1 x Uc max. At θ ≤ 70 °C (AF) 0.85 x Uc min...Uc max. - (AF..Z) 0.85 x Uc min...1.1 x Uc max.			
AC control voltage	Rated control circuit voltage Uc		24...500 V AC			
50/60 Hz	Coil consumption	**Average pull-in value**	(AF) 50 VA - (AF..Z) 16 VA			
		Average holding value	(AF) 2.2 VA / 2 W - (AF..Z) 1.7 VA / 1.5 W			
DC control voltage	Rated control circuit voltage Uc		12...500 V DC			
	Coil consumption	**Average pull-in value**	(AF) 50 W - (AF..Z) 12...16 W			
		Average holding value	(AF) 2 W - (AF..Z) 1.7 W			
PLC-output control			(AF..Z) ≥ 500 mA 24 V DC			
Drop-out voltage			≤ 60 % of Uc min.			
Voltage sag immunity acc. to SEMI F47-0706			(AF..Z) conditions of use on request			
Dips withstand -20 °C ≤ θ ≤ +60 °C			(AF..Z) 22 ms average			
Operating time						
Between coil energization and:		**N.O. contact closing**	40...95 ms			
		N.C. contact opening	38...90 ms			
Between coil de-energization and:		**N.O. contact opening**	11...95 ms			
		N.C. contact closing	13...98 ms			

Mounting characteristics and conditions for use

Contactor types		AF09	AF16	AF26	AF38
Mounting positions					
		Max. add-on N.C. auxiliary contacts: see accessory fitting details for a 4-pole contactor AF09 ... AF38			
Mounting distances		The contactors can be assembled side by side			
Fixing	On rail according to IEC 60715, EN 60715	35 x 7.5 mm or 35 x 15 mm			
	By screws (not supplied)	2 x M4 screws placed diagonally			

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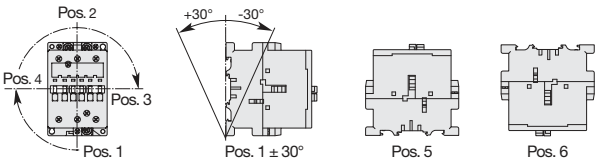
A45 ... A75 4-pole contactors
Technical data

Magnet system characteristics

Contactor types			AC operated	A45	A50	A75
Coil operating limits			**AC supply**	At θ ≤ 55 °C 0.85...1.1 x Uc		
acc. to IEC 60947-4-1				Please also refer to "Mounting characteristics and conditions for use"		
AC control voltage	Rated control circuit voltage Uc		**at 50 Hz**	24…690 V		
			at 60 Hz	24…690 V		
	Coil consumption	**Average pull-in value**	**50 Hz**	180 VA		
			60 Hz	210 VA		
			50/60 Hz (1)	190 VA / 180 VA		
		Average holding value	**50 Hz**	18 VA / 5.5 W		
			60 Hz	18 VA / 5.5 W		
			50/60 Hz (1)	18 VA / 5.5 W		
Drop-out voltage				approx. 40...65 % of Uc		
Operating time						
Between coil energization and:			**N.O. contact closing**	8…27 ms		
			N.C. contact opening	7…22 ms		
Between coil de-energization and:			**N.O. contact opening**	4…11 ms		
			N.C. contact closing	7…14 ms		

(1) 50/60 Hz coils: see "Coil voltage code table".

Mounting characteristics and conditions for use

Contactor types			AC operated	A45	A50	A75
Mounting positions						
				Pos. 5 unauthorized for A45-22-00, A75-22-00		
				Max. add-on N.O. or N.C. auxiliary contacts: see accessory fitting details for 4-pole contactor A45 ... A75		
Control voltage / Ambient temperature						
	Mounting positions (1)	1, 1±30°, 2, 3, 4, 5	**at θ ≤ 55 °C**	0.85…1.1 x Uc		
			at θ ≤ 70 °C	Uc		
		6	**at θ ≤ 55 °C**	0.95…1.1 x Uc		
			at θ ≤ 70 °C	Unauthorized		
Mounting distances				The contactors can be assembled side by side		
Fixing	On rail according to IEC 60715, EN 60715			35 x 15 mm or 75 x 25 mm		
	By screws (not supplied)			2 x M6 screws placed diagonally		

(1) For 60 Hz coil voltage: (only for devices fitted with CA 5-.. and CAL 5-11 auxiliary contacts or TP timer).
– A45-40-00, A50-40-00 and A75-40-00 contactors.
Mounting positions 1 to 5 and ambient temperature ≤ 55 °C: tolerance reduced to 0.9...1.1 Uc (instead of 0.85...1.1 Uc) for coil voltage codes 70 to 79 and 80 to 89.
– A45-22-00 and A75-22-00 contactors.
Mounting positions 1 to 4 and ambient temperature ≤ 55 °C: tolerance reduced to 0.9...1.1 Uc (instead of 0.85...1.1 Uc) for coil voltage codes 70 to 79 and 80 to 89.
For mounting position 6 or ambient temperature of 55 to 70 °C the information given on this page remains applicable.

1SBC101550S0201

AE45 … AE75 4-pole contactors
Technical data

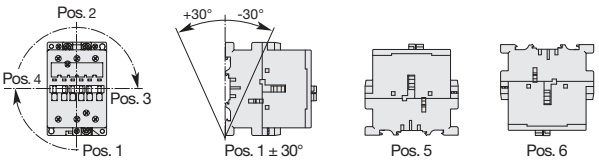
Magnet system characteristics

Contactor types		DC operated	AE45	AE50	AE75
Coil operating limits		**DC supply**	At θ ≤ 55 °C 0.85...1.1 x Uc		
acc. to IEC 60947-4-1			Please also refer to "Mounting characteristics and conditions for use"		
DC control voltage	Rated control circuit voltage Uc		12…250 V DC		
	Coil consumption	**Average pull-in value**	200 W		
		Average holding value	4 W		
Drop-out voltage			approx. 15...40 % of Uc		
Coil time constant	Open	**L/R**	3 ms		
	Closed	**L/R**	15 ms		
Operating time					
Between coil energization and:		**N.O. contact closing**	13…30 ms		
		N.C. contact opening	10…27 ms		
Between coil de-energization and:		**N.O. contact opening** (1)	5…15 ms		
		N.C. contact closing (1)	8…18 ms		

(1) The use of surge suppressors increases the opening time with a factor of 1.1 to 1.5 for RV5 surge suppressor and a factor of 1.5 to 3 for RT5 surge suppressor.

5

Mounting characteristics and conditions for use

Contactor types			DC operated	AE45	AE50	AE75
Mounting positions						
				Pos. 5 unauthorized for AE45-22-00, AE75-22-00		
				Max. add-on N.O. or N.C. auxiliary contacts: see accessory fitting details for 4-pole contactor AE45 … AE75 (1)(2)		
Control voltage / Ambient temperature						
	Mounting positions	1, 1±30°, 2, 3, 4, 5	**at θ ≤ 55 °C**	0.85...1.1 x Uc		
			at θ ≤ 70 °C	Uc		
		6	**at θ ≤ 55 °C**	0.95...1.1 x Uc		
			at θ ≤ 70 °C	Unauthorized		
Mounting distances				The contactors can be assembled side by side		
Fixing	On rail according to IEC 60715, EN 60715			35 x 15 mm or 75 x 25 mm		
	By screws (not supplied)			2 x M6 screws placed diagonally		

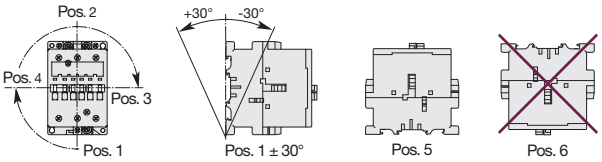
1SBC101552S0201

AF45 … AF75 4-pole contactors
Technical data

Magnet system characteristics

Contactor types		AC / DC operated	AF45	AF50	AF75
Coil operating limits acc. to IEC 60947-4-1		**AC or DC supply**	At θ ≤ 70 °C 0.85 x Uc min...1.1 x Uc max. Please also refer to "Mounting characteristics and conditions for use"		
AC control voltage	Rated control circuit voltage Uc		48…250 V		
50/60 Hz	Coil consumption	**Average pull-in value**	210 VA		
		Average holding value	7 VA / 2.8 W		
DC control voltage	Rated control circuit voltage Uc		20…250 V DC		
	Coil consumption	**Average pull-in value**	190 W		
		Average holding value	2.8 W		
Drop-out voltage			55 % of Uc min.		
Voltage sag immunity acc. to SEMI F47			Conditions of use on request		
Dips withstand			≥ 20 ms		
Operating time					
Between coil energization and:		**N.O. contact closing**	30…100 ms		
		N.C. contact opening	27…95 ms		
Between coil de-energization and:		**N.O. contact opening**	30…110 ms		
		N.C. contact closing	35…115 ms		

Mounting characteristics and conditions for use

Contactor types		AC / DC operated	AF45	AF50	AF75
Mounting positions					
			Pos. 5 unauthorized for AF45-22-00, AF75-22-00 contactors		
			Max. and add-on N.O. or N.C. auxiliary contacts: see accessory fitting details for 4-pole contactor AF45 ... AF110		
Control voltage / Ambient temperature					
Mounting positions	1, 1±30°, 2, 3, 4, 5	**at θ ≤ 70 °C**	0.85 x Uc min…1.1 x Uc max.		
	6		Unauthorized		
Mounting distances			The contactors can be assembled side by side		
Fixing	On rail according to IEC 60715, EN 60715		35 x 15 mm or 75 x 25 mm		
	By screws (not supplied)		2 x M6 screws placed diagonally		

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1SBC101551S0201

EK110 ... EK1000 4-pole contactors
Technical data

Magnet system characteristics

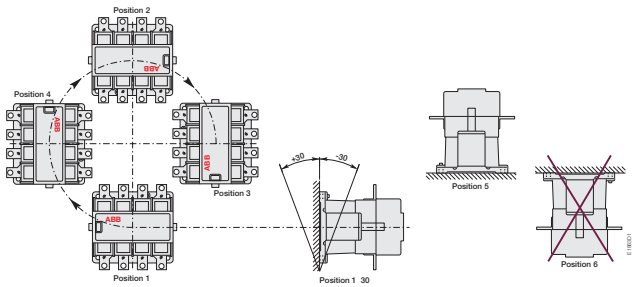
Contactor types		AC operated	EK110	EK150	EK175	EK210	EK370	EK550	EK1000
Coil operating limits acc. to IEC 60947-4-1		AC supply	At θ ≤ 70 °C 0.85 x Uc min...1.1 x Uc max. Please also refer to "Mounting characteristics and conditions for use"						
AC control voltage	Rated control circuit voltage	50 Hz	24...500 V				48...500 V		
		60 Hz	24...600 V				110...600 V		
	Coil consumption	Average pull-in value 50 Hz	800 VA		1100 VA		3500 VA		
		60 Hz	900 VA		1200 VA		4000 VA		
		50/60 Hz (1)	500 /500 VA		630 / 630 VA		3800 / 3400 VA		
		Average holding value 50 Hz	44 VA / 15 W		52 VA / 18 W		125 VA / 50 W		
		60 Hz	52 VA /18 W		65 VA / 22 W		140 VA / 60 W		
		50/60 Hz (1)	2.5 VA / 2.5 W		2.5 VA / 2.5 W		140 VA /60 W		
Drop-out voltage in % of Uc min.			approx. 45...65 % (20...50 % for "E" coil voltage codes)					approx. 45...65 %	
Operating time									
Between coil energization and:		N.O. contact closing	20...40 (1) / 30...50 (2) ms					30...60 ms	
		N.C. contact opening	15...35 (1) / 25...45 (2) ms					25...55 ms	
Between coil de-energization and:		N.O. contact opening	7.5...15 (1) / 95...120 (2) ms					10...20 ms	
		N.C. contact closing	10...18 (1) / 100...125 (2) ms					13...23 ms	

(1) "A" coil voltage: see "Coil voltage code table".
(2) 50/60 Hz "E" coil voltage codes, see "Coil voltage code table".

Magnet system characteristics

Contactor types		DC operated	EK110	EK150	EK175	EK210	EK370	EK550	EK1000
Coil operating limits acc. to IEC 60947-4-1		DC supply	At θ ≤ 70 °C 0.85 x Uc min...1.1 x Uc max. Please also refer to "Mounting characteristics and conditions for use"						
DC control voltage	Rated control circuit voltage		12...220				24...220		
	Coil consumption	Average pull-in value	500 W		630 W		1100 W		
		Average holding value	2.5 W		2.5 W		20 W		
Drop-out voltage			approx. 15...50 % of Uc min.						
Coil time constant	Open	L/R	8 ms				12 ms		
	Closed	L/R	50 ms				60 ms		
Operating time									
Between coil energization and:		N.O. contact closing	30...50 ms				60...80 ms		
		N.C. contact opening	27...47 ms				55...75 ms		
Between coil de-energization and:		N.O. contact opening	10...35 ms						
		N.C. contact closing	13...38 ms						

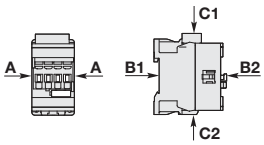
Mounting characteristics and conditions for use

Contactor types			AC / DC operated	EK110	EK150	EK175	EK210	EK370	EK550	EK1000
Mounting positions										
				Max. N.O. or N.C. built-in and add-on N.O. or N.C. auxiliary contacts: see accessory fitting details for 4-pole contactor EK110 ... EK1000						
Control voltage / Ambient temperature										
Mounting positions	1, 1±30°, 2, 3, 4, 5		at θ ≤ 70 °C	0.85...1.1 x Uc						
	2		at θ ≤ 70 °C	Unauthorized				0.85...1.1 x Uc		
	6		at θ ≤ 70 °C	Unauthorized						
Mounting distances				The contactors can be assembled side by side						
Fixing	On rail according to IEC 60715, EN 60715			–						
	By screws (supplied)			4 x M6				4 x M6 (1)		

(1) Damping elements are supplied.

AF09 ... AF38 4-pole contactors
Technical data

General technical data

Contactor types			AF09	AF16	AF26	AF38
Rated insulation voltage Ui						
acc. to IEC 60947-4-1			690 V			
acc. to UL / CSA			600 V			
Rated impulse withstand voltage Uimp.			6 kV			
Electromagnetic compatibility			Devices complying with IEC 60947-1 / EN 60947-1 - Environment A			
Ambient air temperature close to contactor						
Operation			-40...+70 °C			
Storage			-60...+80 °C			
Climatic withstand			Category B according to IEC 60947-1 Annex Q			
Maximum operating altitude (without derating)			3000 m			
Mechanical durability						
Number of operating cycles			10 millions operating cycles			
Max. switching frequency			3600 cycles/h			
Shock withstand						
acc. to IEC 60068-2-27 and EN 60068-2-27						
Mounting position 1						
		Shock direction	1/2 sinusoidal shock for 11 ms: no change in contact position, closed or open position			
	4 N.O. Main poles	**A**	30 g			
		B1	25 g closed position / 5 g open position			
		B2	15 g			
		C1	25 g			
		C2	25 g			
	2 N.O. + 2 N.C. Main poles	**A**	30 g		30 g closed position / 25 g open position	
		B1	25 g closed position / 5 g open position		25 g closed position / 5 g open position	
		B2	15 g		15 g closed position / 10 g open position	
		C1	25 g		25 g closed position / 20 g open position	
		C2	25 g		25 g closed position / 20 g open position	
Vibration withstand			5...300 Hz			
acc. to IEC 60068-2-6			4 g closed position / 2 g open position			

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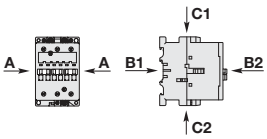
A45 … A75, AE, TAE and AF45 … AF75 4-pole contactors
Technical data

General technical data

Contactor types	**AC operated**	A45	A50	A75
	DC operated	AE45	AE50	AE75
		TAE45	TAE50	TAE75
	AC / DC operated	AF45	AF50	AF75
Rated insulation voltage Ui				
acc. to IEC 60947-4-1		1000 V		
acc. to UL / CSA		600 V		
Rated impulse withstand voltage Uimp.		8 kV		
Electromagnetic compatibility		AF contactors complying with IEC 60947-1 / EN 60947-1 - Environment A		
Ambient air temperature close to contactor				
Operation		-40...+70 °C (1)		
Storage		-60...+80 °C		
Climatic withstand		acc. to IEC 60068-2-30 and 60068-2-11 - UTE C 63-100 specification II		
Maximum operating altitude (without derating)		3000 m		
Mechanical durability				
Number of operating cycles		10 millions operating cycles (5 millions for AE... and TAE... contactors)		
Max. switching frequency		3600 cycles/h (300 for AF...)		
Shock withstand				
acc. to IEC 60068-2-27 and EN 60068-2-27				
Mounting position 1				
	Shock direction	1/2 sinusoidal shock for 11 ms: no change in contact position, closed or open position		
4 N.O. Main poles	**A**	20 g		
	B1	10 g closed position / 5 g open position		
	B2	15 g		
	C1	20 g		
	C2	20 g		
2 N.O. + 2 N.C. Main poles	**A**	20 g		
	B1	10 g closed position / 5 g open position (2)		
	B2	15 g (3)		
	C1	20 g		
	C2	20 g		



(1) 55 °C max. for TAE... contactors.
(2) 3 g in open position for AF 45-22, AE 45-22, AF 75-22 and AE 75-22.
(3) 10 g for AF 45-22, AE 45-22, AF 75-22 and AE 75-22.

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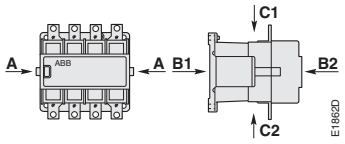
EK110 ... EK1000 4-pole contactors
Technical data

General technical data

Contactor types	AC or DC operated	EK110	EK150	EK175	EK210	EK370	EK550	EK1000
Rated insulation voltage Ui								
acc. to IEC 60947-4-1		1000 V						
acc. to UL		600 V						
Rated impulse withstand voltage Uimp.		8 kV						
Electromagnetic compatibility		EK contactors complying with IEC 60947-1 / EN 60947-1 - Environment A						
Ambient air temperature close to contactor								
Operation	Fitted with thermal overload relay	-25 to +55 °C						-
	Without thermal overload relay	-40 to +70 °C						-
Storage		-50 to +70 °C						-
Climatic withstand		Category B acc. to IEC 60068-2-30						
Maximum operating altitude (without derating)		≤ 3000 m						
Mechanical durability								
Number of operating cycles		10 millions operating cycles				5 millions operating cycles		3 millions operating cycles
Max. switching frequency		3600 cycles/h				60 cycles/h		
Shock withstand								
acc. to IEC 60068-2-27 and EN 60068-2-27								
Mounting position 1								
	Closed or open position	**Shock direction**	1/2 sinusoidal shock for 15 ms: no change in contact position, closed or open position					
		A	10 g					
		B1	10 g					
		B2	10 g					
		C1	10 g					
		C2	10 g					

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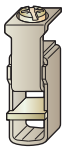
AF09 ... AF38 4-pole contactors
Technical data

Connecting characteristics

Contactor types			AF09	AF16	AF26	AF38
Main terminals			Screw terminals with cable clamp		 Screw terminals with double connector 2 x (5.5 width x 6.8 depth)	
Connection capacity (min. ... max.)						
Main conductors (poles)						
Rigid	Solid (≤ 4 mm²)	**1 x**	1...6 mm²		1.5...16 mm²	
	Stranded (≥ 6 mm²)	**2 x**	1...6 mm²		1.5...16 mm²	
Flexible with non insulated ferrule		**1 x**	0.75...6 mm²		1.5...16 mm²	
		2 x	0.75...6 mm²		1.5...16 mm²	
Flexible with insulated ferrule		**1 x**	0.75...4 mm²		1.5...16 mm²	
		2 x	0.75...2.5 mm²		1.5...16 mm²	
Bars or lugs		**L <**	9.6 mm		-	
Connection capacity acc. to UL/CSA		**1 or 2 x**	AWG 16...10		AWG 16...6	
Stripping length			10 mm		12 mm	
Tightening torque			1.5 Nm / 13 lb.in		2.5 Nm / 22 lb.in	
Auxiliary conductors (coil terminals)						
Rigid solid		**1 x**	1...2.5 mm²			
		2 x	1...2.5 mm²			
Flexible with non insulated ferrule		**1 x**	0.75...2.5 mm²			
		2 x	0.75...2.5 mm²			
Flexible with insulated ferrule		**1 x**	0.75...2.5 mm²			
		2 x	0.75...1.5 mm²			
Lugs		**L <**	8 mm			
Connection capacity acc. to UL/CSA		**1 or 2 x**	AWG 18...14			
Stripping length			10 mm			
Tightening torque			1.2 Nm / 11 lb.in			
Degree of protection acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529						
Main terminals			IP20			
Coil terminals			IP20			
Screw terminals			Delivered in open position, screws of unused terminals must be tightened			
Main terminals			M3.5		M4.5	
		Screwdriver type	Flat Ø 5.5 / Pozidriv 2			
Coil terminals			M3.5			
		Screwdriver type	Flat Ø 5.5 / Pozidriv 2			

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A45 ... A75, AE, TAE and AF45 ... AF75 4-pole contactors
Technical data

Connecting characteristics

Contactor types			AC operated	A45	A50	A75
			DC operated	AE45	AE50	AE75
				TAE45	TAE50	TAE75
			AC / DC operated	AF45	AF50	AF75
Main terminals				Screw terminals with single connector (13 x 10 mm)		
Connection capacity (min. ... max.)						
Main conductors (poles)						
	Rigid	Solid (≤ 4 mm²)	**1 x**	6...50 mm²		
		Stranded (≥ 6 mm²)	**2 x**	6...25 mm²		
	Flexible with ferrule		**1 x**	6...35 mm²		
			2 x	6...16 mm²		
	Bars or lugs		**L ≤**	-		
			I >	-		
	Connection capacity acc. to UL/CSA		**1 or 2 x**	AWG 8...1		
	Tightening torque	Recommended		4.00 Nm / 35 lb.in		
		Max.		4.50 Nm		
Auxiliary conductors (built-in auxiliary terminals + coil terminals)						
	Rigid solid		**1 x**	1...4 mm²		
			2 x	1...4 mm²		
	Flexible with ferrule		**1 x**	1...2.5 mm²		
			2 x	0.75...2.5 mm²		
	Lugs		**L ≤**	8 mm		
			I >	3.7 mm		
	Connection capacity acc. to UL/CSA		**1 or 2 x**	AWG 18...14		
	Tightening torque	Recommended		1.00 Nm / 9 lb.in		
		Max.		1.20 Nm		
Degree of protection acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529						
	Main terminals			IP10		
	Coil terminals			IP20		
Screw terminals				Delivered in open position, screws of unused terminals must be tightened		
	Main terminals			M6		
			Screwdriver type	Flat Ø 6.5 / Pozidriv 2		
	Coil terminals			M3.5		
			Screwdriver type	Flat Ø 5.5 / Pozidriv 2		

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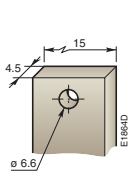
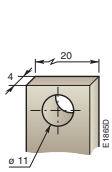
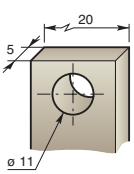
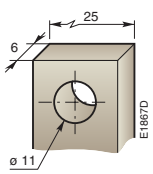
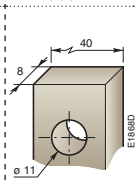
EK110 ... EK1000 4-pole contactors
Technical data

Connecting characteristics

Contactor types		AC or DC operated	EK110	EK150	EK175	EK210	EK370	EK550	EK1000
Main terminals Flat type									
Connection capacity (min. ... max.)									
Main conductors (poles)									
Rigid with connector		Single for Cu cable	25...120 mm²	25...185 mm²	25...185 mm²		70...300 mm²		-
		Single for Al/Cu cable	10...70 mm²	35...120 mm²	35...120 mm²		70...300 mm²		95...300 mm²
		Double for Al/Cu cable	-	-	-		2 x 35...185		2 x 95...300
Bars or lugs	L ≤		30 mm	30 mm	33 mm	33 mm	55 mm	55 mm	55 mm
	Ø >		6 mm	10 mm	10 mm	10 mm	10 mm	10 mm	10 mm
Connection capacity acc. to UL/CSA	1 or 2 x		8 -3 /0 AWG		6 - 250 MCM		2 x 4 - 500 MCM	3 x 4 - 500 MCM	-
Tightening torque		Recommended	5 Nm/44 lb.in	18 Nm / 160 lb.in					
		Max.	6 Nm	22 Nm					
Auxiliary conductors (coil terminals)									
Rigid solid	1 x		0.5...2.5 mm²						
	2 x		0.5...2.5 mm²						
Flexible with ferrule	1 x		0.5...2.5 mm²						
	2 x		0.5...2.5 mm²						
Bars or lugs	L ≤		8 mm						
	I >		3.7 mm						
Connection capacity acc. to UL/CSA	1 or 2 x		18...14 AWG						
Tightening torque		Recommended	1.00 Nm / 9 lb.in						
		Max.	1.20 Nm						
Degree of protection acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529									
Main terminals			IP00						
Coil terminals			IP20						
Screw terminals									
Main terminals			M6		M10				
			Screws and bolts						
Coil terminals (delivered in open positions)			M3.5						
		Screwdriver type	Flat Ø 5.5 mm / Pozidriv 2						

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4-pole contactors
Electrical durability and utilization categories

General

Utilization categories determine the current making and breaking conditions relating to the characteristics of the loads to be controlled by the contactors. International standard IEC 60947-4-1 and European standard EN 60947-4-1 are the standards to be referred to. If Ic is the current to be broken by the contactor and Ie the rated operational current normally drawn by the load, then Ic = Ie for category AC-1. The curve corresponding to category AC-1 represents the electrical durability variation of standard contactors in relation to the breaking current Ic.
Electrical durability is expressed in millions of operating cycles.

Curve utilization mode

Electrical durability forecast and contactor selection for category AC-1

- Note the characteristics of the load to be controlled:
  - Operational voltage ..... Ue
  - Current normally drawn ..... Ie
  - Utilization category AC-1
  - Breaking current ..... Ic = Ie for AC-1
- Define the number of operating cycles N required.
- On the diagram corresponding to the operational category, select the contactor with the curve immediately above the intersection point (Ic ; N).

Case of uninterrupted duty

For uninterrupted duty, some verifications of preventing maintenance are necessary to check the functionality of the concerned product (consult us). The combinated effect of environmental conditions and the proper temperature of the product may require some disposals. As a matter of fact, for this duty, the use duration prevails over the number of operating cycles.

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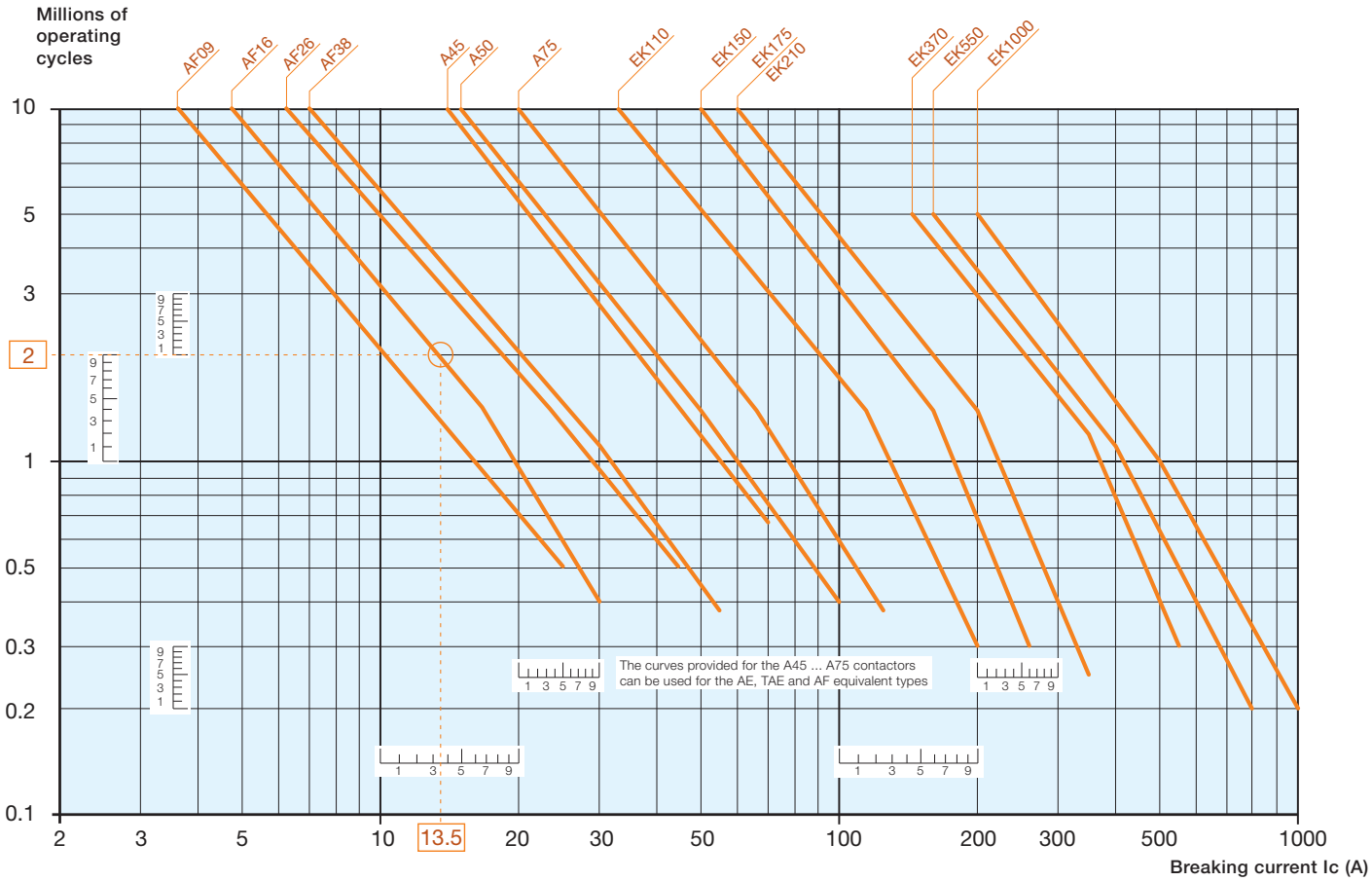
4-pole contactors
Electrical durability

Electrical durability for AC-1 utilization category - Ue ≤ 690 V
Ambient temperature ≤ 60 °C for AF09 ... AF38, ≤ 55 °C for A45 ... EK1000

Switching non-inductive or slightly inductive loads. The breaking current Ic for AC-1 is equal to the rated operational current of the load.

Maximum electrical switching frequency: see "Technical data".



Example:

I_c / AC-1 = 13.5 A – Electrical durability required = 2 millions operating cycles.

Using the AC-1 curves above select the AF16 contactor at intersection "○" (13.5 A / 2 millions operating cycles).

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Contactors for capacitor switching

Overview 5/94

UA16..RA up to UA110..RA - Unlimited peak Î

Ordering details **5**/96

Technical data **5**/99

UA16 up to UA110 - Peak current Î ≤ 100 times the rms current

Ordering details **5**/101

Technical data **5**/104

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Contactors for capacitor switching
AC-6b utilization category according to IEC 60947-4-1

Capacitor transient conditions

In Low Voltage industrial installations, capacitors are mainly used for reactive energy correction (raising the power factor). When these capacitors are energized, overcurrents of high amplitude and high frequencies (3 to 15 kHz) occur during the transient period (1 to 2 ms).

The amplitude of these current peaks, also known as "inrush current peaks", depends on the following factors:

– The network inductances.
– The transformer power and short-circuit voltage.
– The type of power factor correction.

There are 2 types of power factor correction: fixed or automatic.

Fixed power factor correction consists of inserting, in parallel on the network, a capacitor bank whose total power is provided by the assembly of capacitors of identical or different ratings.

The bank is energized by a contactor that simultaneously supplies all the capacitors (a single step).

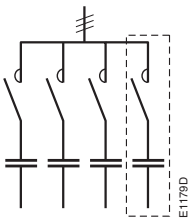
The inrush current peak, in the case of fixed correction, can reach 30 times the nominal current of the capacitor bank.

Single-step capacitor bank scheme
Use the A/AF... contactor ranges.

An automatic power factor correction system, on the other hand, consists of several capacitor banks of identical or different ratings (several steps), energized separately according to the value of the power factor to be corrected.

An electronic device automatically determines the power of the steps to be energized and activates the relevant contactors.

The inrush current peak, in the case of automatic correction, depends on the power of the steps already on duty, and can reach 100 times the nominal current of the step to be energized.



Multi-step capacitor bank scheme
Use the UA... or UA..RA contactor ranges.

Steady state condition data

The presence of harmonics and the network's voltage tolerance lead to a current, estimated to be 1.3 times the nominal current $\mathbf{I_n}$ of the capacitor, permanently circulating in the circuit.

Taking into account the manufacturing tolerances, the exact power of a capacitor can reach 1.15 times its nominal power.

Standard IEC 60831-1 Edition 2002 specifies that the capacitor must therefore have a maximum thermal current $\mathbf{I_T}$ of:

$$\mathbf{I_T} = 1.3 \times 1.15 \times \mathbf{I_n} = 1.5 \times \mathbf{I_n}$$

Consequences for the contactors

To avoid malfunctions (welding of main poles, abnormal temperature rise, etc.), contactors for capacitor bank switching must be sized to withstand:

– **A permanent current that can reach 1.5 times the nominal current of the capacitor bank.**
– **The short but high peak current on pole closing** (maximum permissible peak current $\hat{\mathbf{I}}$).

Contactor selection tool for capacitor switching

In a given application, if the user does not know the value of the inrush current peak, this value can be approximately calculated using the formulas given on the pages **"Calculation and dimensioning"**.

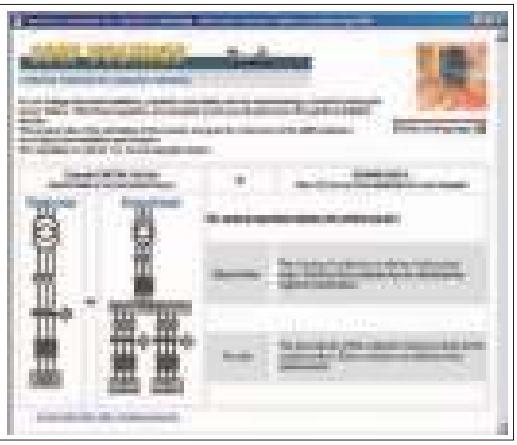
Alternatively by the **CAPCAL selection tool**, available on the ABB Website:
www.abb.com/lowvoltage

right hand side menu

search: **"Online product selection tools"**

select: **"Contactors: AC-6b capacitor switching"**

This program allows the calculation of these peaks and gives the references of the ABB contactors according to the installation specifications. This calculation is valid for one or several capacitor banks.



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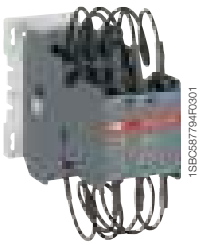
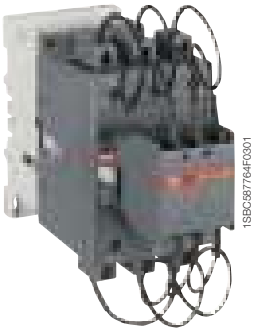
Contactors for capacitor switching
The ABB solutions

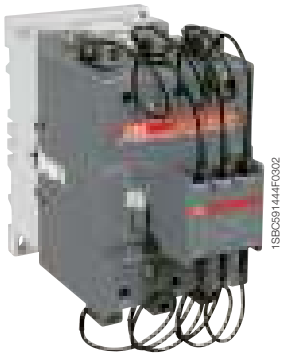
ABB offers 3 contactor versions according to the value of the inrush current peak and the power of the capacitor bank.

UA..RA contactors for capacitor switching (UA16..RA to UA110..RA) with insertion of damping resistors.

The insertion of damping resistors protects the contactor and the capacitor from the highest inrush currents.

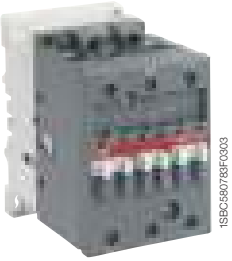






UA... contactors for capacitor switching (UA16 to UA110)

Maximum permissible peak current $\hat{I} \leq$ 100 times the nominal rms current of the switched capacitor.



A... and AF... standard contactors

Maximum permissible peak current $\hat{I} \leq$ 30 times the nominal rms current of the switched capacitor.

Please consult us.

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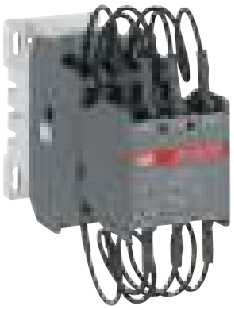
1SBC101604S0201

UA16..RA … UA30..RA 3-pole contactors for capacitor switching
12.5 to 30 kvar - Unlimited peak current Î
AC operated



UA16-30-10RA

UA30-30-10RA

5

Description

UA..RA contactors for capacitor switching can be used for installations in which the peak current far exceeds 100 times nominal rms current. The contactors are delivered complete with their damping resistors and must be used without additional inductances.

The capacitors must be discharged (maximum residual voltage at terminals ≤ 50 V) before being re-energized when the contactors are making.

These contactors are of the block type design with:

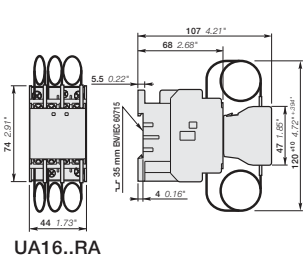
– 3 main poles and 1 built-in auxiliary contact
– the UA..RA contactors are fitted with a special front-mounted block, which ensures the serial insertion of 3 damping resistors into the circuit to limit the current peak on energization of the capacitor bank
  - their connection also ensures capacitor precharging in order to limit the second current peak occurring upon making of the main poles
  - the insertion of resistors allows to damp the highest current peak of the capacitor when switching on, whatever its level.
– control circuit: AC operated
– add-on auxiliary contact blocks for side mounting and a wide range of accessories.

Ordering details

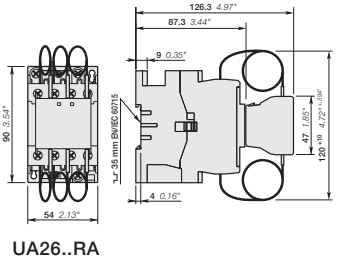
IEC	UL/CSA	Rated control circuit voltage Uc (1)		Auxiliary contacts fitted		Type	Order code		Weight
Rated operational power θ ≤ 40 °C 400 V AC-6b	Rated operational power θ ≤ 40 °C 480 V								Pkg (1 pce)
kvar	kvar	V 50 Hz	V 60 Hz						kg
12.5	16	24	24	1	0	UA16-30-10RA	1SBL181024R8110		0.460
		48	48	1	0	UA16-30-10RA	1SBL181024R8310		0.460
		110	110…120	1	0	UA16-30-10RA	1SBL181024R8410		0.460
		220…230	230…240	1	0	UA16-30-10RA	1SBL181024R8010		0.460
		230…240	240…260	1	0	UA16-30-10RA	1SBL181024R8810		0.460
		380…400	400…415	1	0	UA16-30-10RA	1SBL181024R8510		0.460
		400…415	415…440	1	0	UA16-30-10RA	1SBL181024R8610		0.460
22	22	24	24	1	0	UA26-30-10RA	1SBL241024R8110		0.710
		48	48	1	0	UA26-30-10RA	1SBL241024R8310		0.710
		110	110…120	1	0	UA26-30-10RA	1SBL241024R8410		0.710
		220…230	230…240	1	0	UA26-30-10RA	1SBL241024R8010		0.710
		230…240	240…260	1	0	UA26-30-10RA	1SBL241024R8810		0.710
		380…400	400…415	1	0	UA26-30-10RA	1SBL241024R8510		0.710
		400…415	415…440	1	0	UA26-30-10RA	1SBL241024R8610		0.710
30	28	24	24	1	0	UA30-30-10RA	1SBL281024R8110		0.810
		48	48	1	0	UA30-30-10RA	1SBL281024R8310		0.810
		110	110…120	1	0	UA30-30-10RA	1SBL281024R8410		0.810
		220…230	230…240	1	0	UA30-30-10RA	1SBL281024R8010		0.810
		230…240	240…260	1	0	UA30-30-10RA	1SBL281024R8810		0.810
		380…400	400…415	1	0	UA30-30-10RA	1SBL281024R8510		0.810
		400…415	415…440	1	0	UA30-30-10RA	1SBL281024R8610		0.810

(1) Other control voltages see voltage code table.

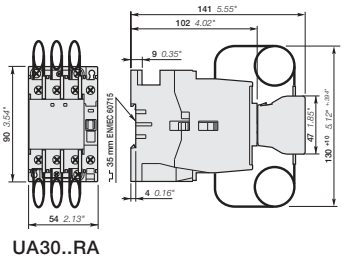
Main dimensions mm, *inches*



UA16..RA



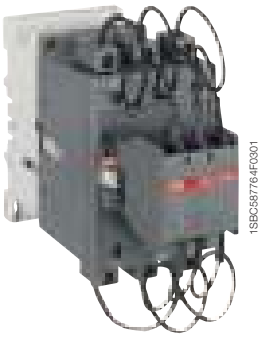
UA26..RA



UA30..RA

1SBC101507S0201

UA50..RA ... UA75..RA 3-pole contactors for capacitor switching
40 to 60 kvar - Unlimited peak current Î
AC operated



UA75-30-00 RA

Description

UA..RA contactors for capacitor switching can be used for installations in which the peak current far exceeds 100 times nominal rms current. The contactors are delivered complete with their damping resistors and must be used without additional inductances.

The capacitors must be discharged (maximum residual voltage at terminals ≤ 50 V) before being re-energized when the contactors are making.

These contactors are of the block type design with:

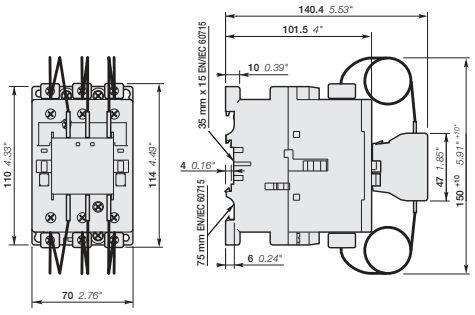
– 3 main poles
– the UA..RA contactors are fitted with a special front-mounted block, which ensures the serial insertion of 3 damping resistors into the circuit to limit the current peak on energization of the capacitor bank
  - their connection also ensures capacitor precharging in order to limit the second current peak occurring upon making of the main poles
  - the insertion of resistors allows to damp the highest current peak of the capacitor when switching on, whatever its level.
– control circuit: AC operated
– add-on auxiliary contact blocks for side mounting and a wide range of accessories.

Ordering details

IEC Rated operational power θ ≤ 40 °C 400 V AC-6b kvar	UL/CSA Rated operational power θ ≤ 40 °C 480 V kvar	Rated control circuit voltage Uc (1) V 50 Hz	V 60 Hz	Auxiliary contacts fitted		Type	Order code		Weight Pkg (1 pce) kg
40	50	24	24	0	0	UA50-30-00RA	1SBL351024R8100		1.350
		48	48	0	0	UA50-30-00RA	1SBL351024R8300		1.350
		110	110...120	0	0	UA50-30-00RA	1SBL351024R8400		1.350
		220...230	230...240	0	0	UA50-30-00RA	1SBL351024R8000		1.350
		230...240	240...260	0	0	UA50-30-00RA	1SBL351024R8800		1.350
		380...400	400...415	0	0	UA50-30-00RA	1SBL351024R8500		1.350
		400...415	415...440	0	0	UA50-30-00RA	1SBL351024R8600		1.350
50	55	24	24	0	0	UA63-30-00RA	1SBL371024R8100		1.350
		48	48	0	0	UA63-30-00RA	1SBL371024R8300		1.350
		110	110...120	0	0	UA63-30-00RA	1SBL371024R8400		1.350
		220...230	230...240	0	0	UA63-30-00RA	1SBL371024R8000		1.350
		230...240	240...260	0	0	UA63-30-00RA	1SBL371024R8800		1.350
		380...400	400...415	0	0	UA63-30-00RA	1SBL371024R8500		1.350
		400...415	415...440	0	0	UA63-30-00RA	1SBL371024R8600		1.350
60	64	24	24	0	0	UA75-30-00RA	1SBL411024R8100		1.350
		48	48	0	0	UA75-30-00RA	1SBL411024R8300		1.350
		110	110...120	0	0	UA75-30-00RA	1SBL411024R8400		1.350
		220...230	230...240	0	0	UA75-30-00RA	1SBL411024R8000		1.350
		230...240	240...260	0	0	UA75-30-00RA	1SBL411024R8800		1.350
		380...400	400...415	0	0	UA75-30-00RA	1SBL411024R8500		1.350
		400...415	415...440	0	0	UA75-30-00RA	1SBL411024R8600		1.350

(1) Other control voltages see voltage code table.

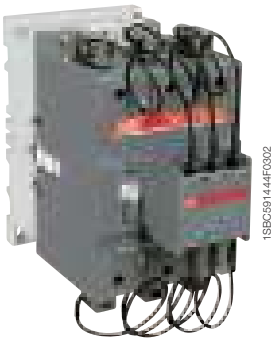
Main dimensions mm, *inches*



UA50..RA, UA63..RA, UA75..RA

1SBC101508S0201

UA95..RA ... UA110..RA 3-pole contactors for capacitor switching
70 to 80 kvar - Unlimited peak current Î
AC operated



UA110-30-00 RA

5

Description

UA..RA contactors for capacitor switching can be used for installations in which the peak current far exceeds 100 times nominal rms current. The contactors are delivered complete with their damping resistors and must be used without additional inductances.

The capacitors must be discharged (maximum residual voltage at terminals ≤ 50 V) before being re-energized when the contactors are making.

These contactors are of the block type design with:

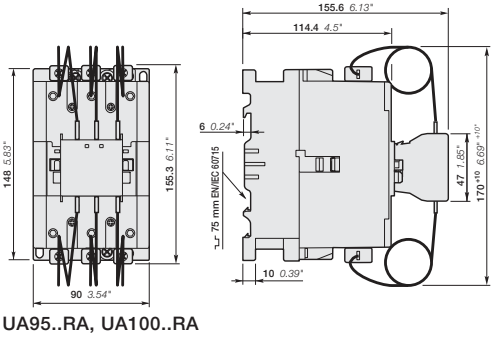
– 3 main poles
– the UA..RA contactors are fitted with a special front-mounted block, which ensures the serial insertion of 3 damping resistors into the circuit to limit the current peak on energization of the capacitor bank
  - their connection also ensures capacitor precharging in order to limit the second current peak occurring upon making of the main poles
  - the insertion of resistors allows to damp the highest current peak of the capacitor when switching on, whatever its level.
– control circuit: AC operated
– add-on auxiliary contact blocks for side mounting and a wide range of accessories.

Ordering details

IEC	UL/CSA	Rated control circuit voltage Uc (1)		Auxiliary contacts fitted		Type	Order code		Weight
Rated operational power θ ≤ 40 °C 400 V AC-6b	Rated operational power θ ≤ 40 °C 480 V	V 50 Hz	V 60 Hz						Pkg (1 pce)
									kg
70	80	24	24	0	0	UA95-30-00RA	1SFL431024R8100		2.000
		48	48	0	0	UA95-30-00RA	1SFL431024R8300		2.000
		110	110...120	0	0	UA95-30-00RA	1SFL431024R8400		2.000
		220...230	230...240	0	0	UA95-30-00RA	1SFL431024R8000		2.000
		230...240	240...260	0	0	UA95-30-00RA	1SFL431024R8800		2.000
		380...400	400...415	0	0	UA95-30-00RA	1SFL431024R8500		2.000
		400...415	415...440	0	0	UA95-30-00RA	1SFL431024R8600		2.000
80	95	24	24	0	0	UA110-30-00RA	1SFL451024R8100		2.000
		48	48	0	0	UA110-30-00RA	1SFL451024R8300		2.000
		110	110...120	0	0	UA110-30-00RA	1SFL451024R8400		2.000
		220...230	230...240	0	0	UA110-30-00RA	1SFL451024R8000		2.000
		230...240	240...260	0	0	UA110-30-00RA	1SFL451024R8800		2.000
		380...400	400...415	0	0	UA110-30-00RA	1SFL451024R8500		2.000
		400...415	415...440	0	0	UA110-30-00RA	1SFL451024R8600		2.000

(1) Other control voltages see voltage code table.

Main dimensions mm, *inches*



UA95..RA, UA100..RA

1SBC101553S0201

UA16..RA ... UA110..RA 3-pole contactors for capacitor switching
Unlimited peak current Î
Technical data

Main pole - Utilization characteristics according to IEC

Contactor types		AC operated	UA16..RA	UA26..RA	UA30..RA	UA50..RA	UA63..RA	UA75..RA	UA95..RA	UA110..RA
Standards			IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1							
Rated operational voltage Ue max.			690 V							
Rated frequency (without derating)			50 / 60 Hz							
AC-6b Utilization category										
Rated operational power AC-6b										
For air temperature close to contactor	θ ≤ 40 °C	230-240 V	8 kvar	12.5 kvar	16 kvar	25 kvar	30 kvar	35 kvar	40 kvar	45 kvar
		400-415 V	12.5 kvar	22 kvar	30 kvar	40 kvar	50 kvar	60 kvar	70 kvar	80 kvar
		440 V	15 kvar	24 kvar	32 kvar	50 kvar	55 kvar	65 kvar	75 kvar	85 kvar
		500-550 V	18 kvar	30 kvar	34 kvar	55 kvar	65 kvar	75 kvar	85 kvar	95 kvar
		690 V	22 kvar	35 kvar	45 kvar	72 kvar	80 kvar	100 kvar	120 kvar	130 kvar
	θ ≤ 55 °C	230-240 V	7.5 kvar	11.5 kvar	16 kvar	24 kvar	27 kvar	30 kvar	35 kvar	40 kvar
		400-415 V	12.5 kvar	20 kvar	27.5 kvar	40 kvar	45 kvar	50 kvar	60 kvar	70 kvar
		440 V	13 kvar	20 kvar	30 kvar	43 kvar	48 kvar	53 kvar	65 kvar	75 kvar
		500-550 V	16 kvar	25 kvar	34 kvar	50 kvar	60 kvar	65 kvar	75 kvar	82 kvar
		690 V	21 kvar	31 kvar	45 kvar	65 kvar	75 kvar	80 kvar	105 kvar	110 kvar
	θ ≤ 70 °C	230-240 V	6 kvar	9 kvar	11 kvar	20 kvar	23 kvar	25 kvar	30 kvar	35 kvar
		400-415 V	10 kvar	15.5 kvar	19.5 kvar	35 kvar	39 kvar	41 kvar	53 kvar	60 kvar
		440 V	11 kvar	17 kvar	20.5 kvar	37 kvar	42.5 kvar	45 kvar	58 kvar	70 kvar
		500-550 V	12.5 kvar	20 kvar	25 kvar	46 kvar	50 kvar	55 kvar	70 kvar	78 kvar
		690 V	17 kvar	26 kvar	32 kvar	60 kvar	65 kvar	70 kvar	85 kvar	100 kvar
Max. permissible peak current Î			Unlimited							
Short-circuit protection device for contactors										
gG type fuse (1)			80 A	125 A	200 A				250 A	
Max. electrical switching frequency			240 cycles/h							
Electrical durability AC-6b		Ue ≤ 440 V	250 000 operating cycles							
		500 V ≤ Ue ≤ 690 V	100 000 operating cycles							

Multi-step capacitor bank scheme

(1) The fuse ratings given represent the maximum ratings ensuring type 1 coordination according to the definition of standard IEC 60947-4-1.

Main pole - Utilization characteristics according to UL / CSA

Contactor types		AC operated	UA16..RA	UA26..RA	UA30..RA	UA50..RA	UA63..RA	UA75..RA	UA95..RA	UA110..RA
Power - 60 Hz										
For air temperature close to contactor	θ ≤ 40 °C	240 V	8 kvar	11 kvar	14 kvar	25 kvar	27.5 kvar	32 kvar	40 kvar	45 kvar
		480 V	16 kvar	22 kvar	28 kvar	50 kvar	55 kvar	64 kvar	80 kvar	95 kvar
		600 V	20 kvar	27 kvar	35 kvar	62 kvar	70 kvar	80 kvar	100 kvar	120 kvar
Max. permissible peak Current Î			Unlimited							

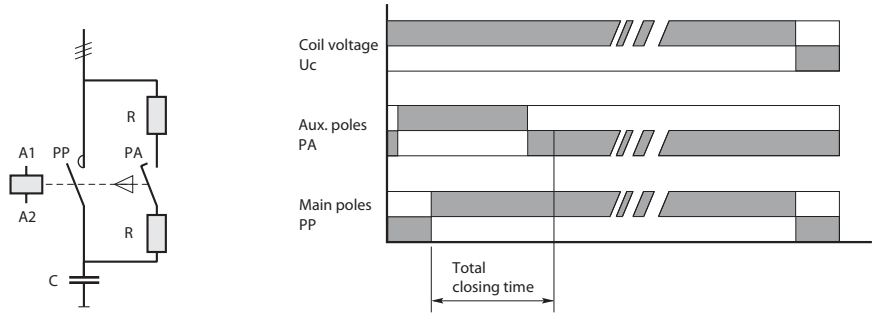
Operating principle

The front-mounted block mechanism of the UA..RA contactors ensures:
- early making of the auxiliary "PA" poles with respect to the main "PP" poles
- automatic return to the open position of the auxiliary "PA" poles after the main poles are closed.

When the coil is energized, the early making auxiliary poles connect the capacitor to the network via the set of 3 resistors. The damping resistors attenuate the first current peak and the second inrush current when the main contacts begin to make. Once the main poles are in the closed position, the auxiliary poles automatically break.

When the coil is de-energized, the main poles break ensuring the breaking of the capacitor bank.

The contactor can then begin a new cycle.



The insertion of resistors allows to damp the highest current peak of the capacitor when switching on, whatever its level.

1SBC101510S0201

UA16..RA ... UA110..RA 3-pole contactors for capacitor switching
Unlimited peak current Î
Technical data

Connecting characteristics

Contactor types		AC operated	UA16..RA	UA26..RA	UA30..RA	UA50..RA UA63..RA UA75..RA	UA95..RA UA110..RA
Connection capacity (min. ... max.)							
Main conductors (poles)							
Rigid	Solid (≤ 4 mm²)	**1 x**	1...4 mm²	1.5...6 mm²	2.5...16 mm²	6...50 mm²	10...95 mm²
	Stranded (≥ 6 mm²)	**2 x**	-	-	2.5...16 + 2.5...6 mm²	6...25 + 6...16 mm²	6...35 mm²
Flexible with ferrule		**1 x**	0.75...2.5 mm²	1.5...4 mm²	2.5...10 mm²	6...35 mm²	10...70 mm²
		2 x	-	-	2.5...10 + 2.5...4 mm²	6...16 + 6...10 mm²	6...35 mm²
Bars or lugs		**L ≤**	7.7 mm	10 mm	-	-	-
		I >	3.7 mm	4.2 mm	-	-	-
Connection capacity acc. to UL/CSA		**1 or 2 x**	AWG 18...10	AWG 12...8	AWG 8...4	AWG 8...1	AWG 6...2/0
Tightening torque	Recommended		1 Nm / 9 lb.in	1.7 Nm / 15 lb.in	2.3 Nm / 20 lb.in	4 Nm / 35 lb.in	8 Nm / 53 lb.in
	Max.		1.2 Nm	2.2 Nm	2.6 Nm	4.5 Nm	9 Nm
Auxiliary conductors							
(built-in auxiliary terminals + coil terminals)							
Rigid solid		**1 x**	1...4 mm²				0.75...2.5 mm²
		2 x	1...4 mm²				0.75...2.5 mm²
Flexible with ferrule		**1 x**	0.75...2.5 mm²			1...2.5 mm²	0.75...2.5 mm²
		2 x	0.75...2.5 mm²				
Lugs	Coil terminals	**L ≤**	8 mm				
		I >	3.7 mm				
	Built-in auxiliary terminals	**L ≤**	7.7 mm	10 mm	8 mm	-	-
		I >	3.7 mm	4.2 mm	3.7 mm	-	-
Connection capacity acc. to UL/CSA		**1 or 2 x**	AWG 18...14				
Tightening torque							
Coil terminals	Recommended		1 Nm / 9 lb.in				
	Max.		1.2 Nm				
Built-in auxiliary terminals	Recommended		1 Nm / 9 lb.in				
	Max.		1.2 Nm				
Degree of protection							
acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529							
Main terminals			IP20		IP10		
Coil terminals			IP20				
Built-in auxiliary terminals			IP20			-	-
Screw terminals			Delivered in open position, screws of unused terminals must be tightened				
Main terminals			M 3.5	M 4	M 5	M6	M8
		Screwdriver type	Flat Ø 5.5 / Pozidriv 2		Flat Ø 6.5 / Pozidriv 2		Hexagon socket (s = 4 mm)
Coil terminals			M 3.5				
		Screwdriver type	Flat Ø 5.5 / Pozidriv 2				
Built-in auxiliary terminals			M 3.5	M 4	M 3.5	-	-
		Screwdriver type	Flat Ø 5.5 / Pozidriv 2			-	-

Other technical characteristics are the same as those of standard A contactors.

1SBC101513S0201

UA16 ... UA30 3-pole contactors for capacitor switching
12.5 to 27.5 kvar - peak current Î ≤ 100 times the rms current
AC operated

UA16-30-10

UA30-30-10

Description

UA contactors can be used for the switching of capacitor banks whose inrush current peaks are less than or equal to 100 times nominal rms current.

The capacitors must be discharged (maximum residual voltage at terminals ≤ 50 V) before being re-energized when the contactors are making.

These contactors are of the block type design with:

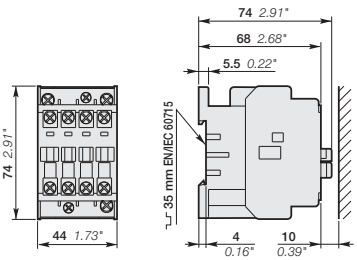
– 3 main poles and 1 built-in auxiliary contact
– control circuit: AC operated
– add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

Ordering details

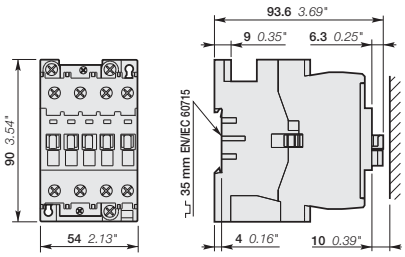
IEC		UL/CSA	Rated control circuit voltage Uc (1)		Auxiliary contacts fitted		Type	Order code		Weight
Rated operational power θ ≤ 40 °C 400 V AC-6b	Max peak current Î	Rated operational power θ ≤ 40 °C 480 V								Pkg (1 pce)
kvar	kA	kvar	V 50 Hz	V 60 Hz						kg
12.5	1.8	-	24	24	1	0	UA16-30-10	1SBL181022R8110		0.340
			48	48	1	0	UA16-30-10	1SBL181022R8310		0.340
			110	110...120	1	0	UA16-30-10	1SBL181022R8410		0.340
			220...230	230...240	1	0	UA16-30-10	1SBL181022R8010		0.340
			230...240	240...260	1	0	UA16-30-10	1SBL181022R8810		0.340
			380...400	400...415	1	0	UA16-30-10	1SBL181022R8510		0.340
			400...415	415...440	1	0	UA16-30-10	1SBL181022R8610		0.340
20	3	25	24	24	1	0	UA26-30-10	1SBL241022R8110		0.600
			48	48	1	0	UA26-30-10	1SBL241022R8310		0.600
			110	110...120	1	0	UA26-30-10	1SBL241022R8410		0.600
			220...230	230...240	1	0	UA26-30-10	1SBL241022R8010		0.600
			230...240	240...260	1	0	UA26-30-10	1SBL241022R8810		0.600
			380...400	400...415	1	0	UA26-30-10	1SBL241022R8510		0.600
			400...415	415...440	1	0	UA26-30-10	1SBL241022R8610		0.600
27.5	3.5	32	24	24	1	0	UA30-30-10	1SBL281022R8110		0.710
			48	48	1	0	UA30-30-10	1SBL281022R8310		0.710
			110	110...120	1	0	UA30-30-10	1SBL281022R8410		0.710
			220...230	230...240	1	0	UA30-30-10	1SBL281022R8010		0.710
			230...240	240...260	1	0	UA30-30-10	1SBL281022R8810		0.710
			380...400	400...415	1	0	UA30-30-10	1SBL281022R8510		0.710
			400...415	415...440	1	0	UA30-30-10	1SBL281022R8610		0.710

(1) Other control voltages see voltage code table.

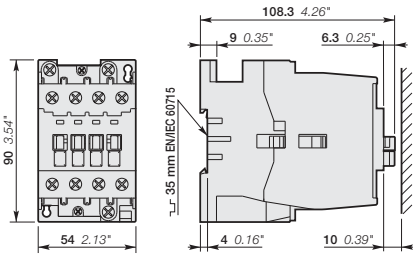
Main dimensions mm, *inches*



UA16



UA26



UA30

UA50 … UA75 3-pole contactors for capacitor switching
33 to 50 kvar - peak current Î ≤ 100 times the rms current
AC operated

UA50-30-00

Description

UA contactors can be used for the switching of capacitor banks whose inrush current peaks are less than or equal to 100 times nominal rms current.

The capacitors must be discharged (maximum residual voltage at terminals ≤ 50 V) before being re-energized when the contactors are making.

These contactors are of the block type design with:

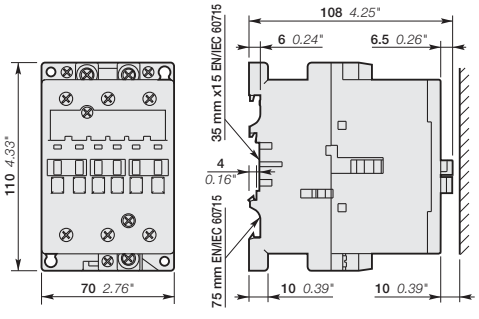
– 3 main poles
– control circuit: AC operated
– add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

Ordering details

IEC		UL/CSA	Rated control circuit voltage Uc (1)		Auxiliary contacts fitted		Type	Order code		Weight
Rated operational power θ ≤ 40 °C 400 V AC-6b	Max peak current Î	Rated operational power θ ≤ 40 °C 480 V								Pkg (1 pce)
kvar	kA	kvar	V 50 Hz	V 60 Hz						kg
33	5	40	24	24	0	0	UA50-30-00	1SBL351022R8100		1.160
			48	48	0	0	UA50-30-00	1SBL351022R8300		1.160
			110	110…120	0	0	UA50-30-00	1SBL351022R8400		1.160
			220…230	230…240	0	0	UA50-30-00	1SBL351022R8000		1.160
			230…240	240…260	0	0	UA50-30-00	1SBL351022R8800		1.160
			380…400	400…415	0	0	UA50-30-00	1SBL351022R8500		1.160
			400…415	415…440	0	0	UA50-30-00	1SBL351022R8600		1.160
45	6.5	-	24	24	0	0	UA63-30-00	1SBL371022R8100		1.160
			48	48	0	0	UA63-30-00	1SBL371022R8300		1.160
			110	110…120	0	0	UA63-30-00	1SBL371022R8400		1.160
			220…230	230…240	0	0	UA63-30-00	1SBL371022R8000		1.160
			230…240	240…260	0	0	UA63-30-00	1SBL371022R8800		1.160
			380…400	400…415	0	0	UA63-30-00	1SBL371022R8500		1.160
			400…415	415…440	0	0	UA63-30-00	1SBL371022R8600		1.160
50	7.5	55	24	24	0	0	UA75-30-00	1SBL411022R8100		1.160
			48	48	0	0	UA75-30-00	1SBL411022R8300		1.160
			110	110…120	0	0	UA75-30-00	1SBL411022R8400		1.160
			220…230	230…240	0	0	UA75-30-00	1SBL411022R8000		1.160
			230…240	240…260	0	0	UA75-30-00	1SBL411022R8800		1.160
			380…400	400…415	0	0	UA75-30-00	1SBL411022R8500		1.160
			400…415	415…440	0	0	UA75-30-00	1SBL411022R8600		1.160

(1) Other control voltages see voltage code table.

Main dimensions mm, *inches*



UA50, UA63, UA75

1SBC101521S0201

UA95 ... UA110 3-pole contactors for capacitor switching
65 to 75 kvar - peak current Î ≤ 100 times the rms current
AC operated

UA110-30-00

Description

UA contactors can be used for the switching of capacitor banks whose inrush current peaks are less or equal to 100 times nominal rms current.
The capacitors must be discharges (maximum residual voltage at terminals ≤ 50 V) before being re-energized when the contactors are making.

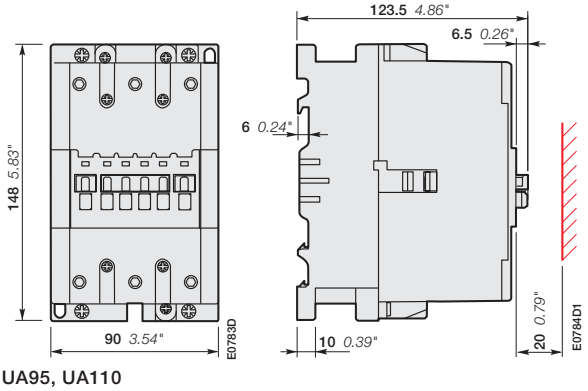
These contactors are of the block type design with:
– 3 main poles
– control circuit: AC operated
– add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

Ordering details

IEC		UL/CSA	Rated control circuit voltage Uc (1)		Auxiliary contacts fitted		Type	Order code		Weight
Rated operational power θ ≤ 40 °C 400 V AC-6b	Max peak current Î	Rated operational power θ ≤ 40 °C 480 V								Pkg (1 pce)
kvar	kA	kvar	V 50 Hz	V 60 Hz						kg
65	9.3	70	24	24	0	0	UA95-30-00	1SFL431022R8100		2.000
			48	48	0	0	UA95-30-00	1SFL431022R8300		2.000
			110	110...120	0	0	UA95-30-00	1SFL431022R8400		2.000
			220...230	230...240	0	0	UA95-30-00	1SFL431022R8000		2.000
			230...240	240...260	0	0	UA95-30-00	1SFL431022R8800		2.000
			380...400	400...415	0	0	UA95-30-00	1SFL431022R8500		2.000
			400...415	415...440	0	0	UA95-30-00	1SFL431022R8600		2.000
75	10.5	80	24	24	0	0	UA110-30-00	1SFL451022R8100		2.000
			48	48	0	0	UA110-30-00	1SFL451022R8300		2.000
			110	110...120	0	0	UA110-30-00	1SFL451022R8400		2.000
			220...230	230...240	0	0	UA110-30-00	1SFL451022R8000		2.000
			230...240	240...260	0	0	UA110-30-00	1SFL451022R8800		2.000
			380...400	400...415	0	0	UA110-30-00	1SFL451022R8500		2.000
			400...415	415...440	0	0	UA110-30-00	1SFL451022R8600		2.000

(1) Other control voltages see voltage code table.

Main dimensions mm, *inches*

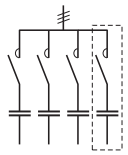


UA95, UA110

UA16 ... UA110 3-pole contactors for capacitor switching
Peak current Î ≤ 100 times the rms current
Technical data

Main pole - Utilization characteristics according to IEC

Contactor types		AC operated	UA16	UA26	UA30	UA50	UA63	UA75	UA95	UA110
Standards			IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1							
Rated operational voltage Ue max.			690 V							
Rated frequency (without derating)			50 / 60 Hz							
AC-6b Utilization category										
Rated operational power AC-6b (1)										
For air temperature close to contactor	**θ ≤ 40 °C**	**230-240 V**	7.5 kvar	12 kvar	16 kvar	20 kvar	25 kvar	30 kvar	35 kvar	40 kvar
		400-415 V	12.5 kvar	20 kvar	27.5 kvar	33 kvar	45 kvar	50 kvar	65 kvar	75 kvar
		440 V	13.7 kvar	22 kvar	30 kvar	36 kvar	50 kvar	55 kvar	65 kvar	75 kvar
		500-550 V	15.5 kvar	22 kvar	34 kvar	40 kvar	50 kvar	62 kvar	70 kvar	80 kvar
		690 V	21.5 kvar	30 kvar	45 kvar	55 kvar	70 kvar	75 kvar	80 kvar	90 kvar
	θ ≤ 55 °C	**230-240 V**	6.7 kvar	11 kvar	16 kvar	20 kvar	25 kvar	30 kvar	35 kvar	40 kvar
		400-415 V	11.7 kvar	18.5 kvar	27.5 kvar	33 kvar	43 kvar	50 kvar	65 kvar	70 kvar
		440 V	13 kvar	20 kvar	30 kvar	36 kvar	48 kvar	53 kvar	65 kvar	75 kvar
		500-550 V	14.7 kvar	22 kvar	34 kvar	40 kvar	50 kvar	62 kvar	70 kvar	80 kvar
		690 V	20 kvar	30 kvar	45 kvar	55 kvar	70 kvar	75 kvar	80 kvar	90 kvar
	θ ≤ 70 °C	**230-240 V**	6 kvar	8.5 kvar	11 kvar	19 kvar	21 kvar	22 kvar	30 kvar	35 kvar
		400-415 V	10 kvar	14.5 kvar	19 kvar	32 kvar	37 kvar	39 kvar	55 kvar	65 kvar
		440 V	11 kvar	16 kvar	20 kvar	35 kvar	41 kvar	43 kvar	55 kvar	70 kvar
		500-550 V	12.5 kvar	19.5 kvar	23.5 kvar	40 kvar	45 kvar	47.5 kvar	60 kvar	75 kvar
		690 V	17 kvar	25 kvar	32 kvar	52 kvar	60 kvar	65 kvar	70 kvar	85 kvar
Max. permissible peak current Î		**Ue ≤ 500 V**	1.8 kA	3 kA	3.5 kA	5 kA	6.5 kA	7.5 kA	9.3 kA	10.5 kA
		Ue > 500 V	1.6 kA	2.7 kA	3.1 kA	4.5 kA	5.8 kA	6.75 kA	8 kA	9 kA
Short-circuit protection device for contactors										
gG type fuse			sized 1.5...1.8 In of the capacitor							
Max. electrical switching frequency			240 cycles/h							
Electrical durability AC-6b		**Ue ≤ 690 V**	100 000 operating cycles							



Multi-step capacitor bank scheme

(1) For 220 V and 380 V, multiply by 0.9 the rated values at 230 V and 400 V respectively.
Example: 50 kvar / 400 V corresponding to 0.9 x 50 = 45 kvar/380 V.

If, in an application, the current peak is greater than the maximum peak current Î specified in the tables above, select a higher rating, refer to the UA..RA contactors, or add inductances. (see application guide "Contactors for capacitor switching").

Main pole - Utilization characteristics according to UL / CSA

Contactor types		AC operated	UA16	UA26	UA30	UA50	UA63	UA75	UA95	UA110
Power - 60 Hz										
For air temperature close to contactor	**θ ≤ 40 °C**	**240 V**	-	12.5 kvar	16 kvar	20 kvar	-	27.5 kvar	35 kvar	40 kvar
		480 V	-	25 kvar	32 kvar	40 kvar	-	55 kvar	70 kvar	80 kvar
		600 V	-	30 kvar	40 kvar	50 kvar	-	70 kvar	75 kvar	85 kvar

If, in an application, the current peak is greater than the maximum peak current Î specified in the tables above, select a higher rating, refer to the UA..RA contactors, or add inductances. (see application guide "Contactors for capacitor switching").

1SBC101536S0201

UA16 … UA110 3-pole contactors for capacitor switching
Peak current Î ≤ 100 times the rms current
Technical data

Connecting characteristics

Contactor types		AC operated	UA16	UA26	UA30	UA50 UA63 UA75	UA95 UA110
Connection capacity (min. ... max.)							
Main conductors (poles)							
Rigid	Solid (≤ 4 mm²)	**1 x**	1...4 mm²	1.5...6 mm²	2.5...16 mm²	6...50 mm²	10...95 mm²
	Stranded (≥ 6 mm²)	**2 x**	1...4 mm²	1.5...6 mm²	2.5...16 mm²	6...25 mm²	6...35 mm²
Flexible with ferrule		**1 x**	0.75...2.5 mm²	0.75...4 mm²	2.5...10 mm²	6...35 mm²	10...70 mm²
		2 x	0.75...2.5 mm²	0.75...4 mm²	2.5...10 mm²	6...16 mm²	6...35 mm²
Bars or lugs		**L ≤**	7.7 mm	10 mm	-	-	-
		I >	3.7 mm	4.2 mm	-	-	-
Connection capacity acc. to UL/CSA		**1 or 2 x**	AWG 18...10	AWG 12...8	AWG 8...4	AWG 8...1	AWG 6...2/0
Tightening torque	Recommended		1 Nm / 9 lb.in	1.7 Nm / 15 lb.in	2.3 Nm / 20 lb.in	4 Nm / 35 lb.in	8 Nm / 71 lb.in
	Max.		1.2 Nm	2.2 Nm	2.6 Nm	4.5 Nm	9 Nm
Auxiliary conductors (built-in auxiliary terminals + coil terminals)							
Rigid solid		**1 x**	1...4 mm²				0.75...2.5 mm²
		2 x	1...4 mm²				0.75...2.5 mm²
Flexible with ferrule		**1 x**	0.75...2.5 mm²			1...2.5 mm²	0.75...2.5 mm²
		2 x	0.75...2.5 mm²				
Lugs	Coil terminals	**L ≤**	8 mm				
		I >	3.7 mm				
	Built-in auxiliary terminals	**L ≤**	7.7 mm	10 mm	8 mm	-	-
		I >	3.7 mm	4.2 mm	3.7 mm	-	-
Connection capacity acc. to UL/CSA			AWG 18...14				
Tightening torque							
Coil terminals	Recommended		1 Nm / 9 lb.in				
	Max.		1.2 Nm				
Built-in auxiliary terminals	Recommended		1 Nm / 9 lb.in				
	Max.		1.2 Nm				
Degree of protection acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529							
Main terminals			IP20			IP10	
Coil terminals			IP20				
Built-in auxiliary terminals			IP20			-	-
Screw terminals			Delivered in open position, screws of unused terminals must be tightened				
Main terminals			M3.5	M4	M5	M6	M8
	Screwdriver type		Flat Ø 5.5 / Pozidriv 2		Flat Ø 6.5 / Pozidriv 2		Hexagon socket (s = 4 mm)
Coil terminals			M3.5				
	Screwdriver type		Flat Ø 5.5 / Pozidriv 2				
Built-in auxiliary terminals			M3.5	M4	M3.5	-	-
	Screwdriver type		Flat Ø 5.5 / Pozidriv 2			-	-

Other technical characteristics are the same as those of standard A contactors.

1SBC101537S0201

1SBC101613S0201

NF 4-pole contactor relays

Ordering details

NF AC / DC operated **5**/108

NFZ AC / DC operated - low consumption **5**/109

Main accessories **5**/110

Technical data

Contacts utilization characteristics according to IEC **5**/112

Contacts utilization characteristics according to UL / CSA **5**/112

General technical data **5**/113

Magnet system **5**/113

Mounting characteristics **5**/113

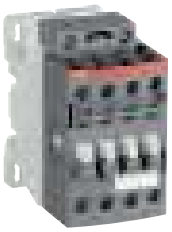
Connecting characteristics **5**/114

Accessories

Accessories for NF contactor relays **5**/115

1SBC101613S0201

NF 4-pole contactor relays
AC / DC operated



NF22E

Description

NF contactor relays are used for switching auxiliary and control circuits.

These contactor relays are of the block type design with:

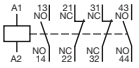
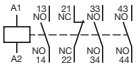
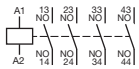
– 4 poles. Contactor relays have mechanically linked auxiliary contact elements (side-marked symbol)

– control circuit: AC or DC operated with electronic coil interface accepting a wide control voltage range (e.g. 100...250 V AC and DC)
  - can manage large control voltage variations
  - only 4 coils to cover control voltages between 24...500 V 50/60 Hz and 20...500 V DC
  - reduced panel energy consumption
  - very distinct closing and opening.

– built-in surge suppression

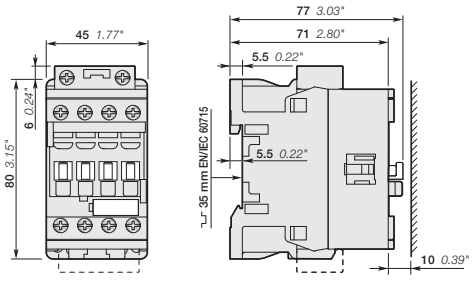
– add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

Ordering details

Number of contacts	Rated control circuit voltage Uc min. ... Uc max. V 50/60 Hz	V DC		Type	Order code		Weight Pkg (1 pce) kg
	24...60	20...60	(1)	NF22E-11	1SBH137001R1122		0.270
	48...130	48...130		NF22E-12	1SBH137001R1222		0.270
	100...250	100...250		NF22E-13	1SBH137001R1322		0.270
	250...500	250...500		NF22E-14	1SBH137001R1422		0.310
	24...60	20...60	(1)	NF31E-11	1SBH137001R1131		0.270
	48...130	48...130		NF31E-12	1SBH137001R1231		0.270
	100...250	100...250		NF31E-13	1SBH137001R1331		0.270
	250...500	250...500		NF31E-14	1SBH137001R1431		0.310
	24...60	20...60	(1)	NF40E-11	1SBH137001R1140		0.270
	48...130	48...130		NF40E-12	1SBH137001R1240		0.270
	100...250	100...250		NF40E-13	1SBH137001R1340		0.270
	250...500	250...500		NF40E-14	1SBH137001R1440		0.310

(1) NF..E-11 not suitable for direct control by PLC-output.

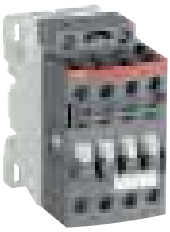
Main dimensions mm, *inches*



NF22E, NF31E, NF40E

1SBC101558S0201

NFZ 4-pole contactor relays
AC / DC operated - low consumption



NFZ22E

Description

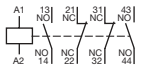
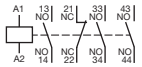
NFZ contactor relays are used for switching auxiliary circuits and control circuits.

These contactor relays are of the block type design with:

– 4 poles. Contactor relays have mechanically linked auxiliary contact elements (side-marked symbol)
– control circuit: AC or DC operated with electronic coil interface accepting a wide control voltage range (e.g. 100...250 V AC and DC)
  - can manage large control voltage variations
  - only 4 coils to cover control voltages between 24...250 V 50/60 Hz and 12...250 V DC
  - allow direct control by PLC-output ≥ 24 V DC 500 mA
  - reduced panel energy consumption
  - very distinct closing and opening
  - can withstand short voltage dips and voltage sags (SEMI F47-0706 conditions of use on request).
– built-in surge suppression
– add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

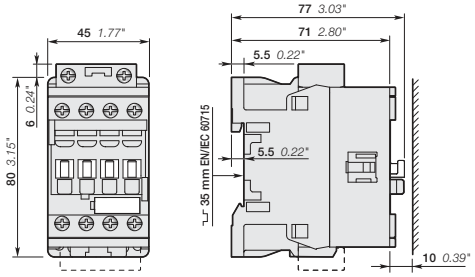
5

Ordering details

Number of contacts	Rated control circuit voltage Uc min. ... Uc max.		Type	Order code		Weight Pkg (1 pce)
	V 50/60 Hz	V DC				kg
	–	12...20	NFZ22E-20	1SBH136001R2022		0.310
	24...60	20...60	NFZ22E-21	1SBH136001R2122		0.310
	48...130	48...130	NFZ22E-22	1SBH136001R2222		0.310
	100...250	100...250	NFZ22E-23	1SBH136001R2322		0.310
	–	12...20	NFZ31E-20	1SBH136001R2031		0.310
	24...60	20...60	NFZ31E-21	1SBH136001R2131		0.310
	48...130	48...130	NFZ31E-22	1SBH136001R2231		0.310
	100...250	100...250	NFZ31E-23	1SBH136001R2331		0.310
	–	12...20	NFZ40E-20	1SBH136001R2040		0.310
	24...60	20...60	NFZ40E-21	1SBH136001R2140		0.310
	48...130	48...130	NFZ40E-22	1SBH136001R2240		0.310
	100...250	100...250	NFZ40E-23	1SBH136001R2340		0.310

Note: Only NFZ contactor relays with DC control voltage 12...20 V DC need to respect the connection polarities indicated close to the coil terminals: A1+ for the positive pole and A2- for the negative pole.

Main dimensions mm, *inches*



NFZ22E, NFZ31E, NFZ40E

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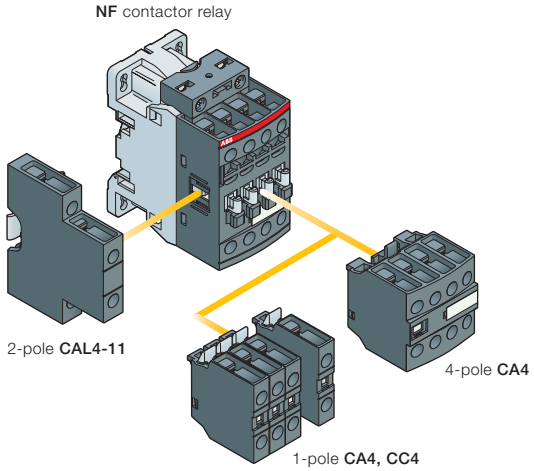
NF 4-pole contactor relays
Main accessories

Contactor relays and main accessories (other accessories available)



Main accessory fitting details

Many configurations of accessories are possible depending on whether these are front-mounted or side-mounted.

Contactor relay types	Main poles			Front-mounted accessories Auxiliary contact blocks 1-pole CA4 1-pole CC4		4-pole CA4		Side-mounted accessories Auxiliary contact blocks Left side 2-pole CAL4-11		Right side
	Max. add-on N.C. auxiliary contacts: 3 N.C. max. on positions 1, 2, 3, 4 and 2 N.C. max. on positions 1 ±30°, 5									
NF..	2	2	E	4 max.	or	1	+	1		–
NF..	3	1	E	2 max.		–	+	1	+	1
	Max. add-on N.C. auxiliary contacts: 4 N.C. max. on positions 1, 2, 3, 4 and 3 N.C. max. on positions 1 ±30°, 5									
NF..	4	0	E	4 max.	or	1	+	1		–
				2 max.		–	+	1	+	1

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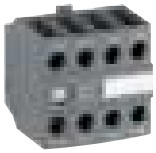
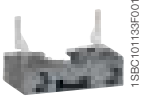
NF 4-pole contactor relays
Main accessories

CA4-10



CA4-22N

CAL4-11



LDC4

BX4

BX4-CA

Ordering details (1)

For contactor relays	Auxiliary contacts				Type	Order code		Pkg qty	Weight (1 pce) kg
Front-mounted instantaneous auxiliary contact blocks									
4-pole NF	1	0	–	–	CA4-10	1SBN010110R1010		1	0.014
	1	0	–	–	CA4-10-T	1SBN010110T1010		10	0.014
	0	1	–	–	CA4-01	1SBN010110R1001		1	0.014
	0	1	–	–	CA4-01-T	1SBN010110T1001		10	0.014
	4	0	–	–	CA4-40N	1SBN010140R1240		1	0.055
	3	1	–	–	CA4-31N	1SBN010140R1231		1	0.055
	2	2	–	–	CA4-22N	1SBN010140R1222		1	0.055
	1	3	–	–	CA4-13N	1SBN010140R1213		1	0.055
NF..40E	0	4	–	–	CA4-04N	1SBN010140R1204		1	0.055
Front-mounted auxiliary contact blocks with N.O. leading contact and N.C. lagging contact									
4-pole NF	–	–	1	0	CC4-10	1SBN010111R1010		1	0.014
	–	–	0	1	CC4-01	1SBN010111R1001		1	0.014
Side-mounted instantaneous auxiliary contact blocks									
NF	1	1	–	–	CAL4-11	1SBN010120R1011		1	0.040
	1	1	–	–	CAL4-11-T	1SBN010120T1011		10	0.040
Additional coil terminal block									
NF					LDC4	1SBN070156T1000		10	0.010
Protective covers									
All 1-stack contactor relays					BX4	1SBN110108T1000		10	0.006
For 4-pole CA4 auxiliary contact blocks					BX4-CA	1SBN110109W1000		50	0.001

(1) See "Main accessory fitting details" table.

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NF contactor relays
Technical data

Contact utilization characteristics according to IEC

Contactor relay types	AC / DC operated	NF
Standards		IEC 60947-1 / 60947-5-1 and EN 60947-1 / 60947-5-1
Rated operational voltage Ue max.		690 V
Rated frequency (without derating)		50 / 60 Hz
Conventional free-air thermal current Ith $\theta \leq 40$ °C		16 A
Ie / Rated operational current AC-15		
acc. to IEC 60947-5-1	24-127 V 50/60 Hz	6 A
	220-240 V 50/60 Hz	4 A
	400-440 V 50/60 Hz	3 A
	500 V 50/60 Hz	2 A
	690 V 50/60 Hz	2 A
Rated making capacity AC-15		10 x Ie AC-15 acc. to IEC 60947-5-1
Rated breaking capacity AC-15		10 x Ie AC-15 acc. to IEC 60947-5-1
Ie / Rated operational current DC-13		
acc. to IEC 60947-5-1	24 V DC	6 A / 144 W
	48 V DC	2.8 A / 134 W
	72 V DC	1 A / 72 W
	110 V DC	0.55 A / 60 W
	125 V DC	0.55 A / 69 W
	220 V DC	0.27 A / 60 W
	250 V DC	0.27 A / 68 W
	400 V DC	0.15 A / 60 W
	500 V DC	0.13 A / 65 W
	600 V DC	0.1 A / 60 W
Short-circuit protection device gG type fuse		10 A
Rated short-time withstand current Icw	for 1.0 s	100 A
	for 0.1 s	140 A
Minimum switching capacity		12 V / 3 mA
with failure rate acc. to IEC 60947-5-4		10^{-7}
Non-overlapping time between N.O. and N.C. contacts		≥ 2 ms
Power dissipation per pole at 6 A		0.1 W
Max. electrical switching frequency	AC-15	1200 cycles/h
	DC-13	900 cycles/h
Mechanically linked contacts acc. to annex L of IEC 60947-5-1		Built-in N.O. or N.C. auxiliary contacts and additional N.O. or N.C. auxiliary contacts (CA4, CAL4 aux. contact blocks) are mechanically linked contacts.

Contact utilization characteristics according to UL / CSA

Contactor relay types	AC / DC operated	NF
Standards		UL 508, CSA C22.2 N°14
Max. operational voltage		600 V AC, 600 V DC
Pilot duty		A600, Q600
AC thermal rated current		10 A
AC maximum volt-ampere making		7200 VA
AC maximum volt-ampere breaking		720 VA
DC thermal rated current		2.5 A
DC maximum volt-ampere making-breaking		69 VA

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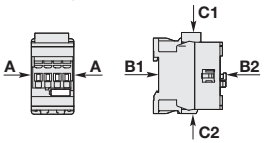
NF contactor relays
Technical data

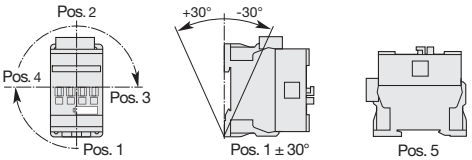
General technical data

Contactor types	**AC / DC operated**	**NF**
Rated insulation voltage Ui		
acc. to IEC 60947-5-1		690 V
acc. to UL / CSA		600 V
Rated impulse withstand voltage Uimp.		6 kV
Electromagnetic compatibility		Devices complying with IEC 60947-1 / EN 60947-1 - Environment A
Ambient air temperature close to contactor		
Operation in free air		-40...+70 °C
Storage		-60...+80 °C
Climatic withstand		Category B according to IEC 60947-1 Annex Q
Maximum operating altitude (without derating)		3000 m
Mechanical durability		
Number of operating cycles		20 millions operating cycles
Max. switching frequency		6000 cycles/h
Shock withstand		
acc. to IEC 60068-2-27 and EN 60068-2-27		
Mounting position 1		
	**Shock direction**	1/2 sinusoidal shock for 11 ms: no change in contact position, closed or open position
	A	30 g
	B1	25 g closed position / 5 g open position
	B2	15 g
	C1	25 g
	C2	25 g
Vibration withstand		5...300 Hz
acc. to IEC 60068-2-6		4 g closed position / 2 g open position

Magnet system characteristics

Contactor relay types		**AC / DC operated**	**NF**
Coil operating limits		**AC supply**	At θ ≤ 60 °C 0.85 x Uc min...1.1 x Uc max.
acc. to IEC 60947-5-1			At θ ≤ 70 °C 0.85 x Uc min...Uc max.
		DC supply	At θ ≤ 60 °C 0.85 x Uc min...1.1 x Uc max.
			At θ ≤ 70 °C (AF) 0.85 x Uc min...Uc max. - (NFZ) 0.85 x Uc min...1.1 x Uc max.
AC control voltage	Rated control circuit voltage Uc		24...500 V AC
50/60 Hz	Coil consumption	**Average pull-in value**	(NF) 50 VA - (NFZ) 16 VA
		Average holding value	(NF) 2.2 VA / 2 W - (NFZ) 1.7 VA / 1.5 W
DC control voltage	Rated control circuit voltage Uc		12...500 V DC
	Coil consumption	**Average pull-in value**	(NF) 50 W - (NFZ) 12...16 W
		Average holding value	(NF) 2 W - (NFZ) 1.7 W
PLC-output control			(NFZ) ≥ 500 mA 24 V DC
Drop-out voltage			≤ 60 % of Uc min.
Voltage sag immunity acc. to SEMI F47-0706			(NFZ) conditions of use on request
Dips withstand			
-20 °C ≤ θ ≤ +60 °C			(NFZ) 22 ms average
Operating time			
Between coil energization and:		**N.O. contact closing**	40...95 ms
		N.C. contact opening	38...90 ms
Between coil de-energization and:		**N.O. contact opening**	11...95 ms
		N.C. contact closing	13...98 ms

Mounting characteristics

Contactor types		**AC / DC operated**	**NF**
Mounting positions			
			Max. add-on N.C. auxiliary contacts: see accessory fitting details for a NF contactor relay
Mounting distances			The contactor relays can be assembled side by side.
Fixing	On rail according to IEC 60715, EN 60715		35 x 7.5 mm or 35 x 15 mm
	By screws (not supplied)		2 x M4 screws placed diagonally

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NF contactor relays
Technical data

Connecting characteristics

Contactor types		**AC / DC operated**	**NF**
Main terminals			Screw terminals with cable clamp
Connection capacity (min. ... max.)			
Pole and coil terminals			
	Rigid	**1 x**	1...2.5 mm²
		2 x	1...2.5 mm²
	Flexible with non insulated ferrule	**1 x**	0.75...2.5 mm²
		2 x	0.75...2.5 mm²
	Flexible with insulated ferrule	**1 x**	0.75...2.5 mm²
		2 x	0.75...1.5 mm²
	Lugs	**L <**	8 mm
	Connection capacity acc. to UL/CSA	**1 or 2 x**	AWG 18...14
	Stripping length		10 mm
	Tightening torque		
	Pole terminals		1.2 Nm / 11 lb.in
	Coil terminals		1.2 Nm / 11 lb.in
Degree of protection acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529			
	All terminals		IP20
Screw terminals			Delivered in open position, screws of unused terminals must be tightened
	All terminals		M3.5
		Screwdriver type	Flat Ø 5.5 / Pozidriv 2

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Accessories for AF09 … AF38 contactors and NF contactor relays

Auxiliary contact blocks **5**/116
Interlocks **5**/117
Mechanical latching unit **5**/118
Connection accessories for starting solutions **5**/119
Other accessories **5**/120

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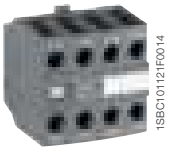
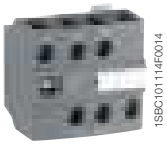
Auxiliary contact blocks

CA4-10

CAL4-11



CA4-22M



CAT4-11E

Description

The auxiliary contact blocks are used for the operation of auxiliary circuits and control circuits for standard industrial environments.

Types of auxiliary contact blocks for front mounting:

- CA4 1 or 4-pole block, with instantaneous N.O., N.C. contacts
- CC4 1-pole block, with N.O. leading contact or N.C. lagging contact
- CAT4 2-pole block, with instantaneous N.O. + N.C. contacts and A1 / A2 coil terminal connection on front face.

Select the 4-pole auxiliary contact blocks CA4-..E, CA4-..M, CA4-..U or CA4-..N type, according to the contactor or contactor relay type for compliance with the standard requirements (see "Terminal marking and positioning").

Types of auxiliary contact blocks for side mounting:

- CAL4 2-pole block, with instantaneous N.O. + N.C. contacts.

For clipping onto the right and/or lefthand side of the contactors.

The auxiliary contact blocks are equipped with screw type connecting terminals delivered open, protected against accidental direct contact and bear the corresponding function marking.

Ordering details (1)

For contactors	Auxiliary contacts				Type	Order code		Pkg qty	Weight (1 pce)
									kg
Front-mounted instantaneous auxiliary contact blocks									
AF09 ... AF38 4-pole NF	1	0	–	–	CA4-10	1SBN010110R1010		1	0.014
	1	0	–	–	CA4-10-T	1SBN010110T1010		10	0.014
	0	1	–	–	CA4-01	1SBN010110R1001		1	0.014
	0	1	–	–	CA4-01-T	1SBN010110T1001		10	0.014
AF09 ... AF16..-30-10	2	2	–	–	CA4-22M	1SBN010140R1122		1	0.055
	3	1	–	–	CA4-31M	1SBN010140R1131		1	0.055
	1	3	–	–	CA4-13M	1SBN010140R1113		1	0.055
	0	4	–	–	CA4-04M	1SBN010140R1104		1	0.055
AF26 ... AF38..-30-00 AF09 ... AF38..-40-00 AF09 ... AF38..-22-00	2	2	–	–	CA4-22E	1SBN010140R1022		1	0.055
	3	1	–	–	CA4-31E	1SBN010140R1031		1	0.055
	4	0	–	–	CA4-40E	1SBN010140R1040		1	0.055
AF26 ... AF38..-30-00 AF09 ... AF16..-40-00	0	4	–	–	CA4-04E	1SBN010140R1004		1	0.055
AF09 ... AF16..-30-01	2	2	–	–	CA4-22U	1SBN010140R1322		1	0.055
	3	1	–	–	CA4-31U	1SBN010140R1331		1	0.055
	4	0	–	–	CA4-40U	1SBN010140R1340		1	0.055
4-pole NF	4	0	–	–	CA4-40N	1SBN010140R1240		1	0.055
	3	1	–	–	CA4-31N	1SBN010140R1231		1	0.055
	2	2	–	–	CA4-22N	1SBN010140R1222		1	0.055
	1	3	–	–	CA4-13N	1SBN010140R1213		1	0.055
NF..40E	0	4	–	–	CA4-04N	1SBN010140R1204		1	0.055
Front-mounted auxiliary contact blocks with N.O. leading contact and N.C. lagging contact									
AF09 ... AF38 4-pole NF	–	–	1	0	CC4-10	1SBN010111R1010		1	0.014
	–	–	0	1	CC4-01	1SBN010111R1001		1	0.014
Side-mounted instantaneous auxiliary contact blocks									
AF09 ... AF38 NF	1	1	–	–	CAL4-11	1SBN010120R1011		1	0.040
	1	1	–	–	CAL4-11-T	1SBN010120T1011		10	0.040
Front-mounted instantaneous auxiliary contact and A1/A2 coil terminal blocks									
AF09 ... AF16..-30-10	1	1	–	–	CAT4-11M	1SBN010151R1111		1	0.040
AF26 ... AF38..-30-00 AF09 ... AF38..-40-00 AF09 ... AF38..-22-00	1	1	–	–	CAT4-11E	1SBN010151R1011		1	0.040
AF09 ... AF16..-30-01	1	1	–	–	CAT4-11U	1SBN010151R1311		1	0.040

(1) For each contactor or contactor relay type, refer to "Accessory fitting details" table.
Note: CAT4 not fittable on AF..Z contactors with DC control voltage 12…20 V DC.

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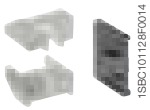
Interlocks



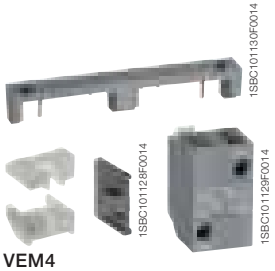
VM4

Mechanical interlock unit

VM4 mechanical interlock unit for the interlocking of two AF contactors.
When mounted between two contactors without additional width, the VM4 mechanical interlock unit prevents one of the contactors from closing as long as the other contactor is closed.
The mechanical interlock unit includes 2 fixing clips (BB4).

Ordering details

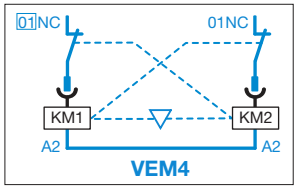
For contactors	Type	Order code		Pkg qty	Weight (1 pce) kg
AF09 ... AF38..-30-.. AF09 ... AF38..-40-00	VM4	1SBN030105T1000		10	0.005



VEM4

Mechanical and electrical interlock set

VEM4 mechanical and electrical interlock set for the interlocking of two AF contactors.
VEM4 set includes a mechanical interlock unit VM4 with 2 fixing clips (BB4) and a VE4 electrical interlock block with A2-A2 connection.
Fixing the electrical interlock block to the contactor front face connects the 2 built-in N.C. interlocking contacts with the two coils. VE4 block must be used with A2-A2 connection to respect the electrical connection diagram.



Ordering details

For contactors	Auxiliary contacts		Type	Order code		Pkg qty	Weight (1 pce) kg
AF09 ... AF16..-30-.. AF26 ... AF38..-30-00 AF09, AF16..-40-00 AF26, AF38..40-00	1	1	VEM4	1SBN030111R1000		1	0.035

Note: VEM4 not fittable on AF..Z contactors with DC control voltage 12...20 V DC.

BB4

Fixing clips

For contactors	Type	Order code		Pkg qty	Weight (1 pce) kg
AF09 ... AF38	BB4	1SBN110120W1000		50	0.002

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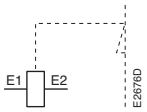
Mechanical latching unit

WB75-A



Terminal marking

Description

For converting standard contactors into latched contactors.

The WB75-A block contains a mechanical latching device with electromagnetic impulse unlatching (AC or DC) or manual unlatching.

Captive screw type connecting terminals, built-in cable clamps, M3.5 (+,-) pozidriv 2 screw with screw-driver guidance; delivered untightened and protected against accidental direct contact.

Operation

After closing, the contactor continues to be held in the closed position by the latching mechanism should the supply voltage fail at the contactor coil terminals.

Contactor opening can be controlled:

– electrically by an impulse* (AC or DC) on the WB75-A block coil.
  * the coil is not designed to be permanently energized.
– manually by pressing the pushbutton on the front face of the WB75-A block.

Mounting

The WB75-A block is clipped onto the front face of the 1-stack contactor where it takes up two slots. The two other slots do not accept CA4 single pole auxiliary contacts. Up to 2 CAL4-11 auxiliary contact blocks can be side-mounted on contactors.

Ordering details

For contactors	Rated control circuit voltage Uc		Type	Order code		Pkg qty	Weight (1 pce)
	V 50 Hz or DC	V 60 Hz					kg
AF09 ... AF38	24	24...28	WB75-A	FPTN372726R1001		1	0.120
	42	42...48	WB75-A	FPTN372726R1002		1	0.120
	48	48...55	WB75-A	FPTN372726R1003		1	0.120
	110	110...127	WB75-A	FPTN372726R1004		1	0.120
	220...230	220...255	WB75-A	FPTN372726R1006		1	0.120
	230...240	230...277	WB75-A	FPTN372726R1005		1	0.120
	380...415	380...440	WB75-A	FPTN372726R1007		1	0.120
	415...440	440...480	WB75-A	FPTN372726R1008		1	0.120

Note: For WB75-A produced since week 06-2012.

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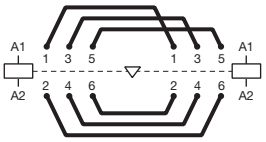
Connection accessories for starting solutions

BEA16-4



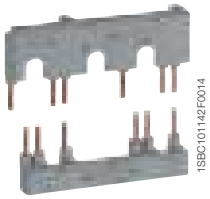
Connecting links with manual motor starters

The BEA..-4 connecting links are used to connect AF09 ... AF38 contactors with the MS116 or MS132 manual motor starters.

The BEA..-4 insulated 3-pole connecting links ensure the electrical and mechanical connection between the contactor and the associated manual motor starter.

Ordering details

For 3-pole contactors	Manual motor starter	Type	Order code		Pkg qty	Weight (1 pce) kg
AF09 ... AF16	MS116-0.16 ... MS116-25, MS132-0.16... MS132-25	BEA16-4	1SBN081306T1000		10	0.025
AF26 ... AF38	MS116-0.16 ... MS116-16, MS132-0.16 ... MS132-10	BEA26-4	1SBN082306T1000		10	0.025
	MS116-20 ... MS116-32, MS132-12 ... MS132-32	BEA38-4	1SBN082306T2000		10	0.030



BER16-4

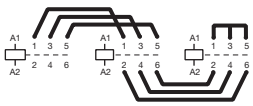
Connection sets for reversing contactors

BER16-4 and BER38-4 connection sets between the main poles of two 3-pole contactors mounted side by side.

The connection sets are made up of 1 upstream and 1 downstream connections: insulated, solid copper bars.

Ordering details

For 3-pole contactors	Type	Order code		Pkg qty	Weight (1 pce) kg
AF09 ... AF16	BER16-4	1SBN081311R1000		1	0.045
AF26 ... AF38	BER38-4	1SBN082311R1000		1	0.100

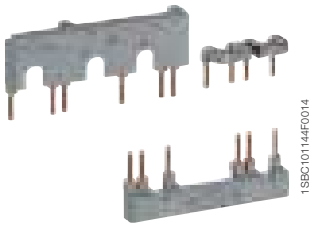


Connection sets for star-delta starting

BEY16-4 and BEY38-4 connection sets between the main poles of the Line, Delta and Star contactors of a star-delta starter.

The connection sets are made up of:

– Line contactor / delta contactor: upstream phase-to-phase connection
– Delta contactor / star contactor: downstream connection in parallel
– Star contactor: star point upstream.



BEY16-4

Ordering details

For 3-pole line, delta & star contactors	Interlock unit between delta & star contactors	Type	Order code		Pkg qty	Weight (1 pce) kg
AF09 ... AF16	With or without VM4 or VEM4	BEY16-4	1SBN081313R2000		1	0.050
AF26 ... AF38	With or without VM4 or VEM4	BEY38-4	1SBN082713R2000		1	0.110

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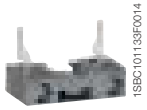
Other accessories



LDC4

Ordering details

For contactors	Type	Order code		Pkg qty	Weight (1 pce) kg

Additional coil terminal block

Additional coil terminal block for a bottom access to the coil terminals of contactors or contactor relays.

AF09 ... AF38, NF	LDC4	1SBN070156T1000		10	0.010

BX4

Protective covers

Sealable and transparent protective covers BX4 and non-removable BX4-CA to protect the devices against accidental contact.

All 1-stack contactors and contactor relays	BX4	1SBN110108T1000		10	0.006
For 4-pole CA4 and 2-pole CAT4 auxiliary contact blocks	BX4-CA	1SBN110109W1000		50	0.001

5

BP38-4

Mounting piece

Mounting piece for replacement of A / AL26 ... A / AL40 contactors fixed by screws by AF contactors in 45 mm width.

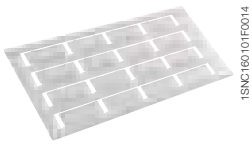
AF09 ... AF38	BP38-4	1SBN112303T1000		10	0.003

Function markers

Box of 16 blank cards (16 markers by card) printable on HTP500 thermal transfer printer and AMS 500 marking table to identify your contactors, overload relays or manual motor starters.

Marker dimensions: 7 x 20 mm (.276" x .787").

Box of 16 blank cards	BA4	1SNA235156R2700		16	0.011
AMS 500 support plate for 8 BA4	SPRC 1	1SNA360010R1500		1	0.220
HTP500 support plate	HTP500-BA4	1SNA235712R2400		1	0.290



BA4

Terminal connecting strips and shorting bars

Parallel and series connection of 3-pole contactor:

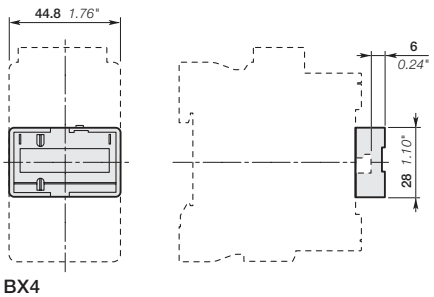
– To obtain a star point (3 parallel-connected poles)
– To connect poles in parallel and thus increase the AC load passing through the flow path made up of the parallel-connected poles
  The relevant cable cross-sectional area may limit the maximum permissible current. Consult the information in the table below
– To connect poles in series and thus increase the DC load controlled by the poles: LY16-4 and LY38-4 secable strips.

Types	for connection of "n" poles	with terminal	insulated
LY...	n = 2 (secable LY16-4, LY38-4 connecting strips)	no	yes
	n = 3	no	yes

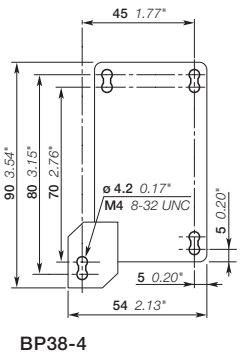
LY16-4

For contactors	max. nominal continuous current with "n" poles				Cable cross-sectional area	Type	Order code		Pkg qty	Weight (1 pce) kg
	in parallel			in series						
	2 poles A	3 poles A	4 poles A	2 poles A	mm²					
AF09	30	33	-	25	6	LY16-4	1SBN071303T1000		10	0.006
AF12	32	36	-	27						
AF16	34	40	-	30						
AF26	50	60	-	45	10	LY38-4	1SBN072303T1000		10	0.012

Main dimensions mm, *inches*



BX4



BP38-4

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Accessories for A40 … AF2050 contactors

Auxiliary contact blocks **5**/122
Pneumatic timer blocks **5**/123
Mechanical interlock units **5**/124
Mechanical and electrical interlock units **5**/124
Function markers - Mounting piece **5**/125
Electronic timer for star-delta starters **5**/126
Surge suppressors for contactor coils **5**/127
Interface relays **5**/128
Mechanical latching unit **5**/129
Additional terminal blocks **5**/130
Terminals for control lead connections **5**/131
Terminal shrouds **5**/132
Terminal enlargements - Terminal extensions **5**/133
Connector terminals **5**/134
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Connecting links for contactors and manual motor starters **5**/136
Connection bars for contactor and MCCB **5**/137
Connection bars for contactor and switch fuse **5**/138
Connection sets for reversing contactors **5**/139
3-pole connections phase to phase **5**/139
Connections for 4-pole changeover contactors **5**/139
Connection sets for star-delta starter **5**/140
Mounting plates for A95 ... AF750 contactors **5**/141
Adapter plates for A95 ... AF750 contactors **5**/142
Main contact sets - Arc chutes for 3-pole contactors **5**/143
Contactor coils **5**/144

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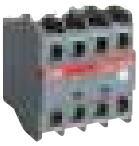
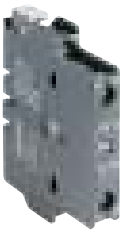
Auxiliary contact blocks

CA5-10



CA5-40E

CAL5-11



CAL18-11

Description

The auxiliary contact blocks are used for the operation of auxiliary circuits and control circuits for standard industrial environments.

Types of auxiliary contact blocks for front mounting:

– CA5 1 or 4-pole block, instantaneous with N.O., N.C. contacts

– CC5 1-pole block, with N.O. leading contact or N.C. lagging contact.

Select the 4-pole auxiliary contact blocks CA5-..E, CA5-..M or CA5-..U type, according to the contactor type for compliance with the standard requirements (see "Terminal Marking and Positioning").

Types of auxiliary contact blocks for side mounting:

– CAL... 2-pole block instantaneous N.O. + N.C. contacts.

For clipping onto the right and/or lefthand side of the contactors.

The CAL18-11B is a second block for mounting in addition to a first CAL18-11 block, right and/or lefthand of the A145 ... A300 and AF145 ... AF2050 contactors.

The auxiliary contact blocks are equipped with screw type connecting terminals delivered open, protected against accidental direct contact and bear the corresponding function marking.

Ordering details

For contactors	Number of blocks (1)	Auxiliary contacts				Type	Order code		Pkg qty	Weight (1 pce) kg
Front-mounted instantaneous auxiliary contact blocks, 1-pole										
A40, AL40, TAL40	1-5	1	0	–	–	CA5-10	1SBN010010R1010		10	0.014
A45 ... A110	1-6	0	1	–	–	CA5-01	1SBN010010R1001		10	0.014
AF45, AF110	1-6	–	–	1	0	CC5-10	1SBN010011R1010		10	0.014
AE45 ... AE75, TAE45 ... TAE75	1-6	–	–	0	1	CC5-01	1SBN010011R1001		10	0.014
Front-mounted instantaneous auxiliary contact blocks, 4-pole										
A45 ... A110	1	4	0	–	–	CA5-40E	1SBN010040R1040		2	0.060
AE45 ... AE75	1	3	1	–	–	CA5-31E	1SBN010040R1031		2	0.060
AF45 ... AF110	1	2	2	–	–	CA5-22E	1SBN010040R1022		2	0.060
TAE45 ... TAE75	1	0	4	–	–	CA5-04E	1SBN010040R1004		2	0.060
		1	1	1	1	CA5-11/11E	1SBN010040R1018		2	0.060
A40-30-10	1	3	1	–	–	CA5-31M	1SBN010040R1131		2	0.060
AL40-30-10	1	2	2	–	–	CA5-22M	1SBN010040R1122		2	0.060
TAL40-30-10	1	1	3	–	–	CA5-13M	1SBN010040R1113		2	0.060
		0	4	–	–	CA5-04M	1SBN010040R1104		2	0.060
		1	1	1	1	CA5-11/11M	1SBN010040R1118		2	0.060
A40-30-01	1	4	0	–	–	CA5-40U	1SBN010040R1340		2	0.060
AL40-30-01	1	3	1	–	–	CA5-31U	1SBN010040R1331		2	0.060
TAL40-30-01	1	2	2	–	–	CA5-22U	1SBN010040R1322		2	0.060
		0	4	–	–	CA5-04U	1SBN010040R1304		2	0.060
Side-mounted instantaneous auxiliary contact blocks, 2-pole										
A40 ... A75	1-2	1	1	–	–	CAL5-11	1SBN010020R1011		2	0.050
AL40, TAL40	1									
AE45 ... AE75, TAE45 ... TAE75	1									
AF45 ... AF75	1-2									
UA16 ... UA75	1-2									
A95 ... A300	1-2	1	1	–	–	CAL18-11	1SFN010720R1011		2	0.050
AF95 ... AF2050	1-2									
UA95, UA110	1-2									
A145 ... A300	1-2(2)	1	1	–	–	CAL18-11B	1SFN010720R3311		2	0.050
AF145 ... AF2050	1-2(2)									

(1) For each contactor type, refer to "Accessory fitting details" table.

(2) 2 blocks CAL18-11 + 2 blocks CAL18-11B.

Note:

– The front-mounted auxiliary contact blocks provided for the A... contactors can be used for the UA..., GA... and GAE... types

– The CAL... auxiliary contact blocks can be used for GA... contactors:

GA75-10-00: 2 x CAL5-11 blocks

GA75-10-11: 1 x CAL5-11 block

GAE75-10-00: 1 x CAL5-11 block

GAE75-10-11: no add-on block.

– The CAL... auxiliary contact blocks can be used for UA..RA contactors. See "Accessory fitting details" for this contactor type.

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Pneumatic timer blocks

TP40DA

BX-TP

Description

The timer blocks are equipped with adjustable time delay auxiliary contacts.

Types

– TP40DA, TP180DA (blue button) for time delay on energization

– TP40IA, TP180IA (black button) for time delay on de-energization.

Pneumatic timer with 350° linear scale and setting via marked knurled knob.
Block equipped with 2 time-delayed auxiliary contacts: 1 N.O. and 1 N.C.
Captive screw type connecting terminals with built-in cable clamps. M3.5 (+,-) pozidriv 2 screw with screwdriver guidance, supplied untightened and protected against accidental direct contact.
Clipped onto the front panel of A40 ... A75 1-stack contactors.

Accessory

BX-TP plastic sealed cover protecting access to the time delay setting.

Ordering details (1)

For contactors	Time delay setting	Type	Order code		Pkg qty	Weight (1 pce) kg
Pneumatic timer blocks for time delay on energization						
A40 ... A75 1-stack	0.1...40 s	TP40DA	1SBN020300R1000		1	0.070
	10...180 s	TP180DA	1SBN020300R1001		1	0.070
Pneumatic timer blocks for time delay on de-energization						
A40 ... A75 1-stack	0.1...40 s	TP40IA	1SBN020301R1000		1	0.070
	10...180 s	TP180IA	1SBN020301R1001		1	0.070
Accessory						
–		BX-TP	FPTN472657R0001		1	0.006

Note: The TP... timers provided for A40 ... A75 contactors can be used for the AF, AE, TAE, UA, GA and GAE contactors.
(1) For each contactor type, refer to "Accessory fitting details" table.

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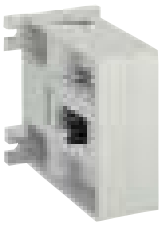
Mechanical interlock units
Mechanical and electrical interlock units



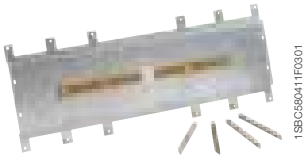
VM300H

Description

When mounted between two contactors, the mechanical interlock unit prevents one of the contactors from closing as long as the other contactor is closed.

– VM... interlock units for mechanical interlocking of two horizontal or vertical mounted AC or DC operated contactors
– VE... interlock units for mechanical and electrical interlocking of two horizontal mounted AC or DC operated contactors.

Ordering details (1)



VM1650H

Mechanical interlock units for two horizontal mounted contactors (1)

Left side contactor	Right side contactor	Mounting	Type	Order code		Pkg qty	Weight (1 pce) kg
A40	A40	Rail mounting	VM5-1	1SBN030100R1000		1	0.066
A40	A45 ... A110	See table below with VE5-.. type	–	–		–	–
A45 ... A75	A45 ... A110		–	–		–	–
A95 ... A185	A45 ... A110		–	–		–	–
A95 ... A185	A145 ... A300	PN.. mounting plate to be ordered separately	VM300H	1SFN034700R1000		1	0.150
A210 ... A300	A145 ... A300		VM300H	1SFN034700R1000		1	0.150
A210 ... A300	AF400 ... AF460		VM300/460H	1SFN035100R1000		1	0.150
AF400 ... AF1250	AF400 ... AF1250		VM750H	1SFN035700R1000		1	0.200
AF1350 ... AF2050	AF1350 ... AF2050	Plate included	VM1650H	1SFN036503R1000		1	6.000

(1) Mechanical durability: VM5-1 = 5 millions cycles, VM300H ... VM750H = 1 million cycles.
The interlock units provided for A... contactors can be used for AF types.
The interlock units provided for A40.. contactors can be used for AL40.. and TAL40.. types.

VM300V

Up contactor	Down contactor	Mounting	Type	Order code		Pkg qty	Weight (1 pce) kg

Mechanical interlock units for two vertical mounted contactors (2)

A95 ... A185	A145 ... A300	Additional plate (not supplied)	VM300V	1SFN034701R1000		1	0.150
A210 ... A300	A145 ... A300		VM300V	1SFN034701R1000		1	0.150
A210 ... A300	AF400 ... AF460		VM300/460V	1SFN035101R1000		1	0.150
AF400 ... AF1250	AF400 ... AF1250		VM750V	1SFN035701R1000		1	0.200

(2) Mechanical durability: VM300V ... VM750V = 1 million cycles.

VE5-1

Left side contactor	Right side contactor	Mounting	Type	Order code		Pkg qty	Weight (1 pce) kg

Mechanical and electrical interlock units for two horizontal mounted contactors

A40	A40	Rail mounting	VE5-1	1SBN030110R1000		1	0.076
A40 ... A75	A45 ... A75		VE5-2	1SBN030210R1000		1	0.146
A45 ... A75	A40 ... A75		VE5-2	1SBN030210R1000		1	0.146
A45 ... A75	A95 ... A110	PN.. mounting plate to be ordered separately	VE5-2 (3)	1SBN030210R1000		1	0.146
A95 ... A110	A45 ... A75		VE5-2 (3)	1SBN030210R1000		1	0.146
A95 ... A110	A95 ... A110		VE5-2	1SBN030210R1000		1	0.146

(3) The combination of A45 ... A75 contactors interlocked with A95, A110 contactors cannot be mounted on symmetrical rail (75 mm, IEC/EN 60715).
The interlock units provided for A... contactors can be used for AE, TAE, AF, GA and GAE types.
The interlock units provided for A40.. contactors can be used for AL40.. and TAL40.. types.

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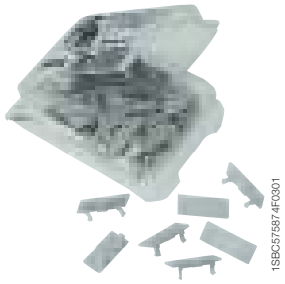
Function markers
Mounting piece



BA5-50

BA5-50 Function markers

Description

For marking contactors, thermal overload relays and accessories.
The BA5-50 is a set of 50 function markers designed to be clipped onto the front face of devices.
Effective marking surface: 7 x 19 mm.
Details can be added to these markers using a ball point pen, indelible felt-tip pen or pentel white.
Self-adhesive labels (not supplied) can also be added to them.

Ordering details

For contactors	Type	Order code		Pkg qty	Weight (1 pce) kg
Contactors, thermal overload relays and accessories	BA5-50	1SBN110000R1000		1	0.017

BP16

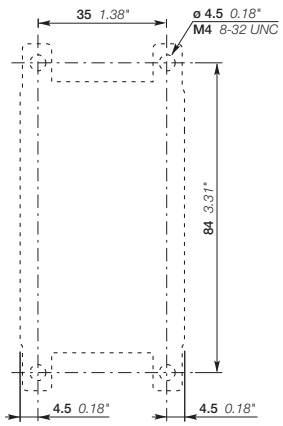
BP16 Mounting piece

Description

Mounting piece for screw fixing (M4, not supplied) of UA, UA..RA series contactors indicated in the table below.
Easy handling of screwdrivers and screw driving.
Add-on mounting piece on contactor's rear face, offering a wide fixing facility.

Ordering details

For contactors	Type	Order code		Pkg qty	Weight (1 pce) kg
UA16, UA16..RA	BP16	1SBN111403R1000		100	0.141

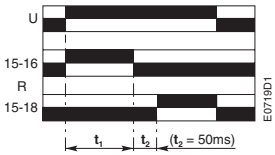


Drilling plan for UA16, UA16..RA contactors with BP16

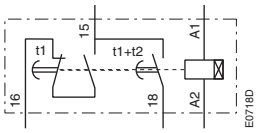
Electronic timer for star-delta starters

TE5S...

5



Chart



Equivalent diagram

Description

When used in star-delta starters, the TE5S lags the star connection and provides a lapse of 50 ms before the switch over to delta connection.

According to the type of device chosen, the electronic circuit has a 24 V AC / DC, 110 to 120 V AC, 220 to 240 V AC or 380 to 440 V AC supply. An output relay with reversing contact ensures high current switching. A two-position switch allows selection of one of the two time delay ranges: 0.8 to 8 s or 6 to 60 s. The 0.1 to 1.0 graduated button allows an initial setting without steps within the previously selected range which can then be adjusted using a chronometer.

Note: We recommend that you allow for temperature drift for the final adjustment of the time delay setting. Drift: -0.2 % per °C.

For example, a setting made at 20 °C will yield a time delay shorter by 7 % at 55 °C in a cubicle (-0.2 % per °C i.e. -0.2 x 35 = -7 %).

Regardless of these settings the TE5S provides a fixed "lapse" of 50 ms between the opening of contact 15-16 and the closing of contact 15-18. This time delay prevents from arc short-circuit during star to delta switching.

Operation

On energization, the green U indicator light (voltage applied) comes on. Contact 15-16 then immediately moves to the closed position.

Count-down of the programmed time immediately commences. When the time delay has elapsed, contact 15-16 opens and at the same time the 50 ms lapse, t2, begins after which contact 15-18 moves to the closed position. The yellow R indicator light comes on.

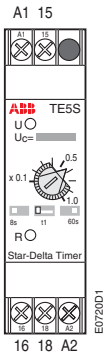
On de-energization, the U and R indicator lights go out and, after the 250 ms resetting time, the device is ready for a new cycle.

Mounting

On 35 x 7.5 mm or 35 x 15 mm mounting rail according to IEC/EN 60715.

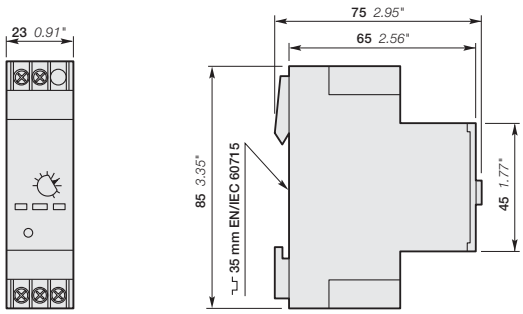
Ordering details

For contactors	Rated control circuit voltage Uc		Type	Order code		Pkg qty	Weight (1 pce)
	V 50/60 Hz	V DC					kg
A40 ... A300	24	24	TE5S-24	1SBN020010R1001		1	0.080
	110...120	–	TE5S-120	1SBN020010R1002		1	0.080
	220...240	–	TE5S-240	1SBN020010R1003		1	0.080
	380...440	–	TE5S-440	1SBN020010R1004		1	0.080



Front face

Main dimensions mm, *inches*



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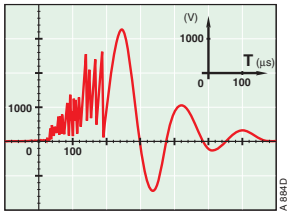
Surge suppressors for contactor coils



Description

The operation of inductive circuits causes overvoltages, in particular on opening of the contactor coil.
The electromagnetic energy stored in the coil during contactor closing is restored on opening in the form of surges, the slope and amplitude of which may rise to several kilovolts. A number of drawbacks are observed ranging from interference on the electronic devices to breakdown of insulators and even destruction of certain sensitive components.
The graph opposite reproduces the oscillogram showing voltage discharges at the terminals of a 42 V / 50 Hz coil without peak clipping. The coil was switched by 8 series-connected poles of a contactor relay.
Following a burst of discharges with a very steep slope a damped oscillation emerges with a peak value of 3500 V.

Overvoltage Factor

The overvoltage factor k is defined as the ratio of the maximum overvoltage peak value Ûs to the peak value Ûc of the coil rated control voltage Uc:

$$k = \frac{\hat{U}s\ max.}{\hat{U}c} \qquad \text{in DC: } k = \frac{\hat{U}s\ max.}{Uc} \qquad \text{or in AC: } k = \frac{\hat{U}s\ max.}{Uc\sqrt{2}}$$

1SBC574001F0301

RV5/50

For example the following is obtained for the above graph: $k = \frac{3500}{42\ \sqrt{2}} \approx 60$

To reduce the harmful effects of these overvoltages, ABB has developed a range of surge suppressors designed to reduce the k factor defined above and to limit or even completely eliminate the high pre-damping voltage frequencies.
Each case is different, but the technical data tolerances and the generous sizing of parts have enabled us to reduce the number of variants.
We have chosen the following solutions: transil diodes, varistors and RC blocks.
Note: A varistor is a resistor whose value decreases to a very large extent when a certain voltage is applied at its terminals.

1SBC573891F0301

RC5-1/50

Ordering details

For contactors	Rated control circuit voltage Uc			Type	Order code		Pkg qty	Weight (1 pce)
	V	AC	DC					kg
A40 ... A110, AL40, AE45 ... AE75, TAL40, TAE45 ... TAE75	24...50	●	●	RV5/50	1SBN050010R1000		2	0.015
	50...133	●	●	RV5/133	1SBN050010R1001		2	0.015
	110...250	●	●	RV5/250	1SBN050010R1002		2	0.015
	250...440	●	●	RV5/440	1SBN050010R1003		2	0.015
A40	24...50	●	–	RC5-1/50	1SBN050100R1000		2	0.012
	50...133	●	–	RC5-1/133	1SBN050100R1001		2	0.012
	110...250	●	–	RC5-1/250	1SBN050100R1002		2	0.012
	250...440	●	–	RC5-1/440	1SBN050100R1003		2	0.012
A45 ... A110	24...50	●	–	RC5-2/50	1SBN050200R1000		2	0.015
	50...133	●	–	RC5-2/133	1SBN050200R1001		2	0.015
	110...250	●	–	RC5-2/250	1SBN050200R1002		2	0.015
	250...440	●	–	RC5-2/440	1SBN050200R1003		2	0.015
A145 ... A300	250...440	●	–	RC5-3/440	1SFN050300R1003		2	0.028
AL40 AE45 ... AE75, TAL40, TAE45 ... TAE75	12...32	–	●	RT5/32	1SBN050020R1000		2	0.015
	25...65	–	●	RT5/65	1SBN050020R1001		2	0.015
	50...90	–	●	RT5/90	1SBN050020R1002		2	0.015
	77...150	–	●	RT5/150	1SBN050020R1003		2	0.015
	150...264	–	●	RT5/264	1SBN050020R1004		2	0.015

Note: The surge suppressors provided for A... contactors can be used for the UA, UA..RA and GA75 types.
The surge suppressors provided for AE45 ... AE75 contactors can be used for the GAE75 types.

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Interface relays

RA5-1

Description

RA5-1 interface relay is designed to receive 24 V DC signals delivered by PLC's or other sources with a low output power and to restore them with sufficient power to operate the coils of the relevant A40 ... A110 contactors.

RA5-1 interface relay is made up of a miniature electromechanical relay equipped with a N.O. contact and with a low consumption 24 V DC coil.

The interface relay coil is controlled by the PLC while the N.O. contact ensures switching of the power contactor.

Coil switching gives rise to overvoltages which have adverse effects on the electronic devices, insulators and, more generally, on component lifetime. The RA5-1 is equipped with surge suppressors:

– on the 24 V DC relay coil via a diode,

– on the power contactor coil via a varistor.

Furthermore, the RA5-1 is protected against relay pole reversal by a diode inserted between the E1 and E2 input terminals.

5

Ordering details

For contactors	Coil voltages	Rated control circuit voltage Uc	Type	Order code		Pkg qty	Weight (1 pce)
	V 50/60 Hz	V DC					kg
A40 ... A110	24...250	24	RA5-1	1SBN060300R1000		1	0.050
			RA5-1	1SBN060300T1000		10	0.050

Note: The interface relays provided for the A... contactors can be used for the UA, UA..RA and GA types.

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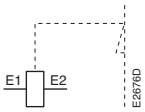
Mechanical latching unit

WB75-A



Terminal marking

Description

For converting standard contactors into latched contactors.

The WB75-A block contains a mechanical latching device with electromagnetic impulse unlatching (AC or DC) or manual unlatching.

Captive screw type connecting terminals, built-in cable clamps, M3.5 (+,-) pozidriv 2 screw with screw-driver guidance; delivered untightened and protected against accidental direct contact.

Operation

After closing, the contactor continues to be held in the closed position by the latching mechanism should the supply voltage fail at the contactor coil terminals.

Contactor opening can be controlled:

– electrically by an impulse* (AC or DC) on the WB75-A block coil.
  * the coil is not designed to be permanently energized.
– manually by pressing the pushbutton on the front face of the WB75-A block.

Mounting

The WB75-A block is clipped onto the front face of the 1-stack contactor where it takes up two slots. The two other slots may accept CA5... single pole auxiliary contacts (1 block on each side of the mechanical latch).

5

Ordering details

For contactors	Rated control circuit voltage Uc		Type	Order code		Pkg qty	Weight (1 pce)
	V 50 Hz or DC	V 60 Hz					kg
A40 ... A75, AF45 ... AF75, AL40, AE45 ... AE75, TAL40, TAE45 ... TAE75, UA16 ... UA75, GA75, GAE75	24	24...28	WB75-A	FPTN372726R1001		1	0.120
	42	42...48	WB75-A	FPTN372726R1002		1	0.120
	48	48...55	WB75-A	FPTN372726R1003		1	0.120
	110	110...127	WB75-A	FPTN372726R1004		1	0.120
	220...230	220...255	WB75-A	FPTN372726R1006		1	0.120
	230...240	230...277	WB75-A	FPTN372726R1005		1	0.120
	380...415	380...440	WB75-A	FPTN372726R1007		1	0.120
	415...440	440...480	WB75-A	FPTN372726R1008		1	0.120

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Additional terminal blocks

LD40

LD75

LD110

5

Description

The LD... terminal block is designed to increase the connecting capacity of the contactor on which it is fitted and for preparation of the wiring before final connection on the contactor.

The LD... blocks are 3-pole terminal blocks with tunnel terminals. The available range can be used on A40 to A110 contactors.

The LD75 and LD110 terminal blocks are fixed in the 3 independent slots located above the built-in connectors.

Ordering details

For contactors	Type	Order code		Pkg qty	Weight (1 pce) kg
A40	LD40	1SBN072808R1000		1	0.075
A45, A75	LD75	1SBN073508R1000		1	0.115
A95, A110	LD110	1SFN074308R1000		1	0.150

Note: The LD... terminal blocks provided for the A... contactors can be used for the AF, AL, AE, TAL, TAE and UA types.

Technical data

Types				LD40	LD75	LD110
Rated insulation voltage Ui						
acc. to IEC 60947-4-1				690 V		
acc. to UL / CSA				600 V		
Main terminals						
				Screw terminals with single connector 8x10 mm	Screw terminals with single connector 10x11 mm	Screw terminals with single connector 12x12 mm
Connection capacity (min. ... max.)						
	Rigid	Solid (≤ 4 mm²)	1 x	4...35 mm²	6...50 mm²	10...70 mm²
		Stranded (≥ 6 mm²)	2 x	4...16 mm²	6...25 mm²	10...35 mm²
	Flexible with ferrule		1 x	4...25 mm²	6...35 mm²	10...50 mm²
			2 x	4...10 mm²	6...16 mm²	10...25 mm²
	Bars			8 mm	10 mm	12 mm
Tightening torque				2.5 Nm	4 Nm	6 Nm
Degree of protection acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529				IP10		
Screw terminals				Delivered in closed position		
				M5	M6	M8
			Screwdriver type	pozidriv 2		Hexagon socket (s = 4 mm)

Note: The utilization of LD... additional terminal blocks keeps the possibility to connect the following cables directly in the contactor main terminals but the BED and BEM connecting sets can no longer be used.

	LD40	LD75	LD110
Possible cross section of rigid cable in the contactor terminals	10 mm²	50 mm²	95 mm²

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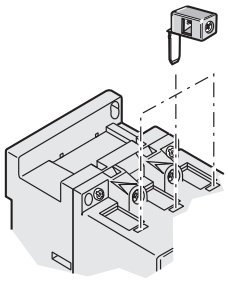
Terminals for control lead connections

LK75-L

LK75-F

LK110



LK... positioning

Description

Terminals designed to connect the control conductors to the main poles of the A45 ... A110 contactors and derivative versions.

Accessories clipped into the slots placed above each power terminal connector.

The LK75... are fitted with a pin designed to hold them in place until the connector has been fully clamped with its power cable.

The LK110 must be held in place until the connector has been clamped.

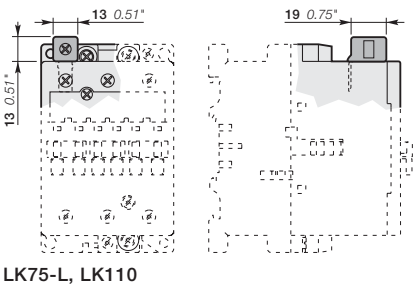
– Degree of protection IP20
– Connecting terminal delivered in open position: cable clamp and M3.5 (+,-) pozidriv 2 screw.
– Cable cross-sectional area:
  - 1 or 2 rigid conductors..... 1...4 mm²
  - 1 or 2 flexible conductors with cable end ..... 0.75...2.5 mm²
– Tightening torque for the LK... screw:
  - recommended ..... 1.00 Nm
  - maxi. ..... 1.20 Nm

Ordering details

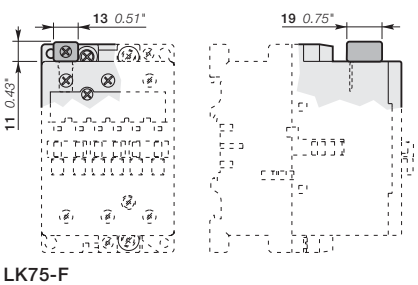
For contactors	Type	Order code		Pkg qty	Weight (1 pce) kg
Right and left on A45 ... A75	LK75-L	1SBN073552R1003		2	0.006
Opposite on A45 ... A75	LK75-F	1SBN073552R1002		2	0.006
Right and left on A95 ... A110	LK110	1SFN074352R1000		2	0.010

Note: The LK... terminals provided for the A... contactors can be used for the AF, AE, AM, TAE, UA, GA and GAE types.

Main dimensions mm, *inches*



LK75-L, LK110



LK75-F

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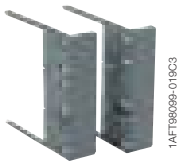
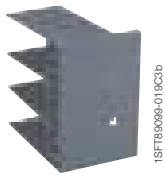
Terminal shrouds



LT...-AC



LT ...-AL

LT...-AY

Description

Main terminal protection for A145 ... AF750 contactors.
The auxiliary contact blocks and coils are designed to provide an IP20 degree of protection.
The main terminals, equipped with lugs or connectors, can be protected against accidental direct contact after wiring (EN 50274) by the addition of terminal shrouds (see table below).

Ordering details

For contactors	Type	Order code		Pkg qty	Weight (1 pce) kg
A145 ... A185 with connectors	LT185-AC	1SFN124701R1000		2	0.050
A145 ... A185 with lugs	LT185-AL	1SFN124703R1000		2	0.220
A145 ... A185 with short. bar LY185 or between A145 and TA200DU or between A185 and TA200DU	LT185-AY	1SFN124704R1000		1	0.050
A210 ... A300 with connectors	LT300-AC	1SFN125101R1000		2	0.070
A210 ... A300 with lugs	LT300-AL	1SFN125103R1000		2	0.280
A210 ... A300 with short. bar LY300	LT300-AY	1SFN125104R1000		1	0.075
AF400 ... AF460 with connectors	LT460-AC	1SFN125701R1000		2	0.100
AF400 ... AF460 with lugs	LT460-AL	1SFN125703R1000		2	0.800
AF580 ... AF750 with connectors	LT750-AC	1SFN126101R1000		2	0.120
AF580 ... AF1250 with lugs	LT750-AL	1SFN126103R1000		2	0.825

Note: The shrouds provided for the A... contactors can be used for the AF... types.

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Terminal enlargements
Terminal extensions

LW...

LW... Terminal enlargements

Description

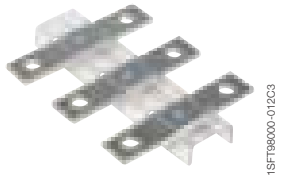
Enlargement pieces designed to increase the width of the contactor terminal pads in order to allow larger connections to be mounted.

Sets containing 3 tin plated copper bars fixed by an isolating spacer.

Ordering details

For contactors	Dimensions		Type	Order code		Pkg qty	Weight (1 pce)
	hole Ø mm	bar mm					kg
A95, A110	6.5	15 x 3	LW110	1SFN074307R1000		1	0.100
A145, A185	10.5	20 x 5	LW185	1SFN074707R1000		1	0.250
A210 ... A300	10.5	25 x 5	LW300	1SFN075107R1000		1	0.450
AF400, AF460	10.5	25 x 5	LW460	1SFN075707R1000		1	0.730
AF580, AF750	13	40 x 6	LW750	1SFN076107R1000		1	1.230
AF1250	13	50 x 10	LW1250	1SFN076407R1000		1	2.000

Note: The LW... pieces provided for the A... contactors can be used for the AF, AE, TAE and UA types.



LX...

LX... Terminal extension

Description

Extension pieces designed to extend the main terminals of contactors for combined mounting of contactors and connection sets.

Sets containing 3 tin plated copper bars fixed by an isolating spacer.

Ordering details

For contactors	Dimensions		Type	Order code		Pkg qty	Weight (1 pce)
	hole Ø mm	bar mm					kg
A145, A185	8.5	20 x 5	LX185	1SFN074710R1000		1	0.250
A210 ... A300	10.5	20 x 5	LX300	1SFN075110R1000		1	0.350
AF400, AF460	10.5	25 x 5	LX460	1SFN075710R1000		1	0.500
AF580, AF750	13	40 x 6	LX750	1SFN076110R1000		1	0.850

Note: The LX... pieces provided for the A... contactors can be used for the AF types.

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Connector terminals

LZ...

LZ...

LZ...

Description

Connection of copper and aluminium cables to the terminal pads of the poles of A and AF contactors.

Ordering details

Cables	For contactors	Cable cross section mm²	Type	Order code		Pkg qty	Weight (1 pce) kg
Single Cu	A145, A185	6...185	–	1SDA023354R0001		3	0.200
	A210 ... A300	16...240	–	1SDA023368R0001		3	0.400
Single Al & Cu	A145, A185	35...95	–	1SDA023356R0001		3	0.100
	A145, A185	25...150	–	1SDA023357R0001		3	0.100
	A210 ... A300	120...240	–	1SDA023370R0001		3	0.200
Double Cu	A145, A185	2 x (50...120)	LZ185-2C/120	1SFN074709R1000		3	0.300
Double	A210 ... A300	2 x (95...120)	–	1SDA025766R0001		3	0.400
Al & Cu	AF400 ... AF750	2 x (120...240)	–	1SDA023380R0001		3	0.110
Triple Al & Cu	AF400 ... AF750	3 x (70...185)	–	1SDA023384R0001		3	0.265
Multi Al & Cu	AF1350, AF1650	4 x (120...240)	–	1SDA023387R0001		3	0.400

Note: Connectors provided for the A... contactors can be used for the AF types.

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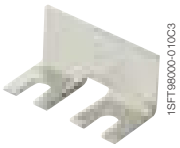
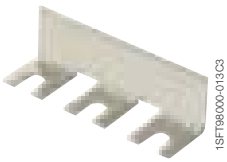
Terminal connecting strips and shorting bars



LP185



LY185

LH...

LF...

Description

Parallel and series connection of 3-pole and 4-pole contactor poles:

– To obtain a star point (3 parallel-connected poles): LY, LF, (LY allows 3 phases to be short-circuited).
– To connect poles in parallel and thus increase the AC load passing through the flow path made up of the parallel-connected poles: LP and LH (2 poles); LY and LF (3 poles) ; LG (4 poles).
  For the maximum permissible current values with parallel-connected poles see "Parallel connection of main poles".
  The relevant cable cross-sectional area may limit the maximum permissible current. Consult the information in the table below.
– To connect poles in series and thus increase the DC load controlled by the poles: LP and LH.

Types	for connection of "n" poles	with terminal	insulated
LP...	n = 2	no	yes (1)
LY...	n = 3	no	yes (1)
LH...	n = 2	yes	no
LF...	n = 3	yes	no

(1) LP460 ... LP750, LY185 ... LY750 not insulated. Use terminal shrouds.

Ordering details

For contactors	max. nominal continuous current with "n" poles A	Cable cross-sectional area mm²	Type	Order code		Pkg qty	Weight (1 pce) kg
A145, A185	300	–	LP185	1SFN074712R1000		2	0.300
A210 ... A300	475	–	LP300	1SFN075112R1000		2	0.400
AF400, AF460	725	–	LP460	1SFN075712R1000		4	0.550
AF580, AF750	1200	–	LP750	1SFN076112R1000		4	0.950
A95, A110	240	–	LY110	1SFN074303R1000		1	0.055
A145, A185	400	–	LY185	1SFN074703R1000		1	0.200
A210 ... A300	670	–	LY300	1SFN075103R1000		1	0.300
AF400, AF460	1000	–	LY460	1SFN075703R1000		1	0.450
AF580, AF750	1650	–	LY750	1SFN076103R1000		1	0.800
A45 ... A75	200	95	LH75	FPTN472734R0001		2	0.085
A40	140	50	LF40	1SBN073205R1000		2	0.037
A45 ... A75	275	150	LF75	FPTN472735R0001		2	0.095

Note: The strips and shorting bars provided for the A... contactors can be used for the AF, AL, AL..Z, AE, TAL and TAE types.

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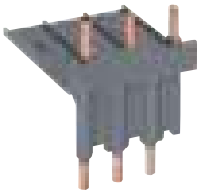
Connecting links for contactors and manual motor starters



BEA40/450

Description

The BEA... connecting links are used to connect a contactor to associated manual motor starters. These are then used together as DOL or reversing starters in type 1 or type 2 coordination, complying with IEC 60947-4-1 and EN 60947-4-1.

The BEA... insulated 3-pole connecting link (touch safe) ensures the electrical linking between the contactor and the corresponding manual motor starter.

Selection table

Ie max. AC-3 400 V A	Contactor & fixing	screws not supplied	Connecting link	MMS &	fixing screws not supplied	Connection set for the contactors	Interlock unit (see "Accessory fitting details")
Direct-on-line starter							
37	A40	2xM4	BEA40/450	MS450	2xM5	–	–
50	A50	2xM4	BEA50/450	MS450	2xM5	–	–
50	A50	2xM6	BEA75/495	MS495	2xM5	–	–
63	A63	2xM6	BEA75/495	MS495	2xM5	–	–
75	A75	2xM6	BEA75/495	MS495	2xM5	–	–
90	A95	2xM6	BEA110/495	MS495	2xM5	–	–
100	A110	2xM6	BEA110/495	MS495	2xM5	–	–
Reversing starter							
37	2xA40	4xM4	BEA40/450	MS450	2xM5	BER40V	VM5-1 / VE5-1
50	2xA50	4xM4	BEA50/450	MS450	2xM5	BEM75-30	VE5-2
50	2xA50	4xM6	BEA75/495	MS495	2xM5	BEM75-30	VE5-2
63	2xA63	4xM6	BEA75/495	MS495	2xM5	BEM75-30	VE5-2
75	2xA75	4xM6	BEA75/495	MS495	2xM5	BEM75-30	VE5-2
90	2xA95	4xM6	BEA110/495	MS495	2xM5	BEM110-30	VE5-2
100	2xA110	4xM6	BEA110/495	MS495	2xM5	BEM110-30	VE5-2

Ordering details

For contactors	Manual motor starter	Type	Order code		Pkg qty	Weight (1 pce) kg
A40	MS450	BEA40/450	1SBN083206R1000		1	0.061
A50	MS450	BEA50/450	1SBN083506R1000		1	0.062
A50, A63, A75	MS495	BEA75/495	1SBN084106R1000		1	0.120
A95, A110	MS495	BEA110/495	1SBN084506R1000		1	0.124

The BEA... connecting links provided for the A... contactors can be used for the AF..., AE..., and TAE... types.

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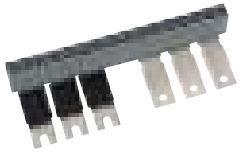
Connection bars for contactor and MCCB

BEA300

BEA...D



BEA300H

Description

Connection between contactors/starters and moulded case circuit breakers.
These connection sets are solid copper bars.

Ordering details

For contactors	MCCB	Type	Order code		Pkg qty	Weight (1 pce) kg
Vertical assembly						
A145, A185, AF145, AF185	T3	BEA185/T3	1SFN084706R1003		1	0.150
A145, A185, AF145, AF185	T4	BEA185/T4	1SFN084706R1005		1	0.150
A210, AF210	T4	BEA210/T4	1SFN085106R1003		1	0.160
A210 ... A300, AF210 ... AF300	T5	BEA300/T5	1SFN085106R1004		1	0.200
AF400 ... AF750	T6	BEA750/T6	1SFN086106R1000		1	0.410
AF400 ... AF750	T5	BEA750/T5	1SFN086106R1001		1	0.410
Vertical assembly with control wire terminals (also suitable when using busbar kits for starter combinations)						
A145, A185, AF145, AF185	T3	BEA185D/T3	1SFN084706R1004		1	0.175
A145, A185, AF145, AF185	T4	BEA185D/T4	1SFN084706R1006		1	0.175
A210, AF210	T4	BEA210D/T4	1SFN085106R1005		1	0.270
A210 ... A300, AF210 ... AF300	T5	BEA300D7T5	1SFN085506R1003		1	0.320
AF400 ... AF750	T6	BEA750D/T6	1SFN086106R1002		1	0.720
AF400 ... AF750	T5	BEA750D/T5	1SFN086106R1003		1	0.720
Horizontal assembly (also suitable when using busbar kits for starter combinations)						
A210 ... A300, AF210 ... AF300	T5	BEA300H/T5	1SFN085307R1002		1	1.280
AF400, AF460	T4	BEA460H/T4	1SFN085907R1000		1	2.450

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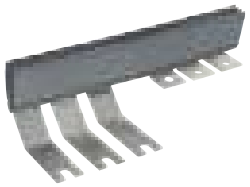
Connection bars for contactor and switch fuse

BEF300/OESA400



BEF300H/OESA400

Description

Connection between contactors/starters and switch fuse.
These connection sets are solid copper bars.

Ordering details

Vertical assembly

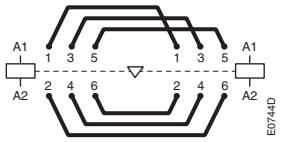
For contactors	Switch fuse	Type	Order code		Pkg qty	Weight (1 pce) kg
A185	OESA250	BEF185/OESA250	1SFN084908R1000		1	0.260
A210 ... A300	OESA250 to OESA400	BEF300/OESA400	1SFN085108R1000		1	0.330
A145	OS160	OSZA15	1SCA022509R0120		1	0.170
AF400, AF460	OESA400	BEF460/OESA400	1SFN085708R1000		1	0.340
AF460 ... AF750	OESA630 to OESA800	BEF750/OESA800	1SFN086108R1000		1	0.740

Horizontal assembly

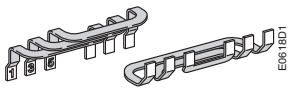
A145	OS160...LR	OSZA15	1SCA022509R0120		1	0.170
A145, A185	OESA250...LR	BEF185H/OESA250	1SFN084709R1000		1	0.550
A210 ... A300	OESA250...LR to OESA400...LR	BEF300H/OESA400	1SFN085109R1000		1	1.200
AF400, AF460	OESA400...LR	OESA460H/OESA400	1SFN085709R1000		1	1.250

Note: The BEF... connection bars provided for the A145 ... A300 contactors can be used for the AF145 ... AF300 contactors.

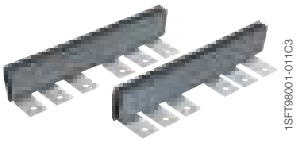
Connection sets



BEM... connections



BEM75-30



BEM300-30

Connection sets for reversing contactors

Description

Connections between the main poles of two 3-pole contactors mounted side by side as reversing contactors. The sets are made up of three upstream connections and three downstream connections.

BER40V – Insulated, stranded, rigid copper wires

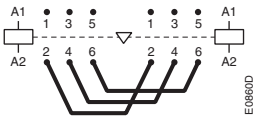
BEM75-30 ... BEM750-30 – Insulated, solid copper bars

On the A... contactors, the power supply by bars or cables equipped with lugs is directly connected to the terminal pads of the main poles. For flange connectors, LX... terminal extension pieces should be used.

Ordering details

For 3-pole contactors	Type	Order code		Pkg qty	Weight (1 pce) kg
A40	BER40V	1SBN082411R1000		1	0.085
A50 ... A75	BEM75-30	1SBN083501R1000		1	0.243
A95, A110	BEM110-30	1SFN084301R1000		1	0.450
A145, A185	BEM185-30	1SFN084701R1000		1	0.900
A210 ... A300	BEM300-30	1SFN085101R1000		1	1.100
AF400, AF460	BEM460-30	1SFN085701R1000		1	4.400
AF580, AF750	BEM750-30	1SFN086101R1000		1	7.300

Note: The connections provided for the A... contactors can be used for the AF, AL, TAL, AE and TAE types.



BES... for 3-pole connections

BES...

3-pole connections phase to phase

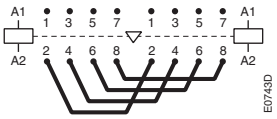
Description

Connections between the main poles of two 3-pole contactors horizontal mounted.
This set is made up of three downstream or upstream connections.

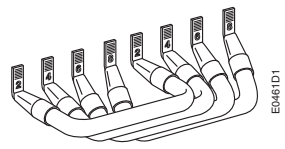
Ordering details

For 3-pole contactors	Type	Order code		Pkg qty	Weight (1 pce) kg
A50 ... A75	BES75-30	1SBN083504R1000		1	0.130
A95, A110	BES110	1SFN084304R1000		1	0.250
A145, A185	BES185	1SFN084704R1000		1	0.500
A210 ... A300	BES300	1SFN085104R1000		1	1.000
AF400, AF460	BES460	1SFN085704R1000		1	2.200
AF580, AF750	BES750	1SFN086104R1000		1	3.700

Note: The connections provided for the A... contactors can be used for the AF, AE and TAE types.



BES... for 4 N.O. main pole connections



BES75-40

Connections for 4-pole changeover contactors

Description

Connection between the main poles of two 4-pole contactors mounted side by side so that they operate as source reversing contactors.

These sets are made up of four downstream connections, with insulated, stranded, rigid copper cables.

Ordering details

For 4-pole contactors	Type	Order code		Pkg qty	Weight (1 pce) kg
A45, A50, A75	BES75-40	1SBN083302R1000		1	0.400

Note: The connections provided for the A... contactors can be used for the AF, AE and TAE types.

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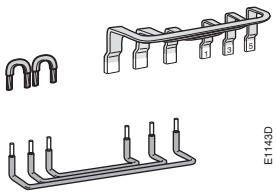
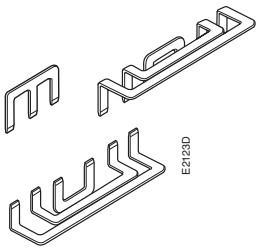
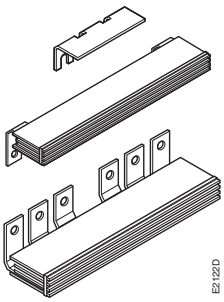
Connection sets



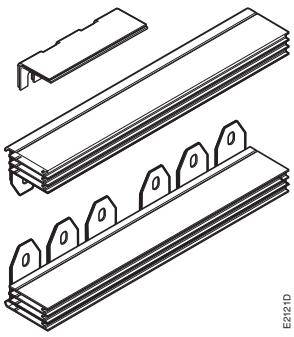
BED 75-1



BED 110



BED 185



BED 400

Connection sets for star-delta starter

Description

Connections between the main poles of a star-delta starter.
These sets are made up of:
– Three line contactor / delta contactor connections - Upstream side
– Three connections for star and delta contactors - Downstream side
– The necessary elements to create the star point upstream of the star contactor.
BED50 / BED50-1, BED75 / BED75-1 – Solid copper bars and insulated stranded copper wires.
BED95 ... BED750 – Insulated, solid copper bars.
BED50-1 ... BED75-1 connection sets are designed for star and delta contactors without mechanical interlock unit (contactors mounting joined side by side).
For mechanically interlocked star and delta contactors use BED50 ... BED75 connection sets.
BED95 ... BED750 are designed for both star and delta contactors with or without mechanical interlock unit.

Ordering details

For contactors		Interlock unit between star and delta contactors	Type	Order code		Weight Pkg (1 pce)
Line and delta	Star					kg
A63	A40	–	BED50-1	1SBN083503R1001		0.180
		VE5-2	BED50	1SBN083503R1000		0.280
A75	A50	–	BED75-1	1SBN084103R1001		0.180
		VE5-2	BED75	1SBN084103R1000		0.250
A95	A75	VE5-2	BED95	1SFN084303R1000		0.400
A110	A95	VE5-2	BED110	1SFN084503R1000		0.500
A145	A110	VM300H	BED145A	1SFN084703R1000		1.300
A185	A145	VM300H	BED185	1SFN084903R1000		1.100
A210	A185	VM300H	BED210	1SFN085103R1000		1.500
A260	A210	VM300H	BED300	1SFN085303R1000		2.100
A300	A260					
AF400	A260	VM300/460H	BED400	1SFN085503R1000		3.500
AF460	A300					
AF460	AF400	VM750H	BED460	1SFN085703R1000		4.700
AF580	AF400	VM750H	BED580	1SFN085903R1000		6.300
AF580	AF460					
AF750	AF580	VM750H	BED750	1SFN086103R1000		7.700

Note: The connections provided for A... contactors can be used for the AL, AE, TAL and TAE types.

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Mounting plates for A95 ... AF750 contactors

PN300A-11

PN300-21

PN300-41

Description

Mounting plates with fixing holes for the specified contactors and overload relays.

Ordering details

For contactors		For overload relays	Type	Order code		Pkg qty	Weight (1 pce) kg
Mounting plates for Direct on line starters							
A145, A185		TA200DU, E200DU	PN185-11	1SFN094705R1000		1	1.100
A210 ... A300		TA450DU, E320DU	PN300A-11	1SFN095105R1000		1	1.650
AF400, AF460		E500DU	PN460-11	1SFN095705R1000		1	2.120
AF580, AF750		E800DU	PN750-11	1SFN096105R1000		1	2.500

For two contactors side by side with space for mechanical interlock		For one or two overload relays	Type	Order code		Pkg qty	Weight (1 pce) kg
Mounting plates for mechanical interlocked contactors, reversing starters and two speed starters for double windings							
A95, A110		TA80DU, TA110DU	PN110-21	1SFN094301R1000		1	0.600
A145, A185		TA200DU, E200DU	PN185-21	1SFN094701R1000		1	1.800
A210 ... A300		TA450DU, E320DU	PN300-21	1SFN095101R1000		1	2.530
AF400, AF460		E500DU	PN460-21	1SFN095701R1000		1	3.490
AF580, AF750		E800DU	PN750-21	1SFN096101R1000		1	4.230

For main and delta contactors	For star contactor (1)	For overload relays	Type	Order code		Pkg qty	Weight (1 pce) kg
Mounting plates for star-delta starters and two speed starters for single windings							
A95, A110	A75, A95	TA80DU or TA110DU	PN110-41	1SFN094303R1000		1	0.950
A145, A185	A110, A145	E200DU or TA200DU	PN185-41	1SFN094903R1000		1	2.440
A210 ... A300	A185 ... A300	E320DU or TA450DU	PN300-41	1SFN095503R1000		1	3.440
AF400, AF460	A300, AF400	E500DU	PN460-41	1SFN095703R1000		1	5.310
AF580, AF750	AF400 ... AF580	E800DU	PN750-41	1SFN096103R1000		1	6.320

(1) Space for mechanical interlock included

Note: The mounting plates provided for A... contactors can be used for the AF... contactors.

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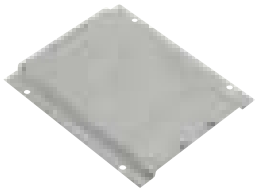
Adapter plates for A95 ... AF750 contactors



PR300-1

PR400-2

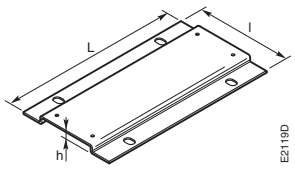
Description

Adapter plates with fixing holes for specified old contactors to new contactors.

Ordering details

From old contactors	To new contactor	Type	Order code		Pkg qty	Weight (1 pce)
						kg
EH65, EH75, EH80, EH90, EG80	A95, A110	PR110-1	1SFN094500R1000		1	0.270
EH100, EH145	A110, A145	PR145-1	1SFN094700R1000		1	0.360
EH150, EH160, EH175, EH210, EG160	A185, A210	PR210-1	1SFN094900R1000		1	0.440
EH250, EH260, EH300	A210 ... A300	PR300-1	1SFN095300R1000		1	0.560
EH370, EH550, EG315	AF400 ... AF580	PR460-1	1SFN095700R1000		1	0.900
EH700, EH800	AF750	PR750-1	1SFN096100R1000		1	0.500
OKYM150, OKYM175	A185	PR185-2	1SFN095100R1001		1	0.500
OKYM200, OKYM250	A210 ... A300	PR300-2	1SFN095300R1001		1	0.500
OKYM315	AF400, AF460	PR400-2	1SFN095700R1002		1	0.820
OKYM400	AF400, AF460	PR460-2	1SFN095700R1001		1	0.800
OKYM500	AF580	PR580-2	1SFN096100R1002		1	0.700
EH550, EG630, OKYM630	AF580, AF750	PR750-2	1SFN096100R1001		1	1.100

Note: The adapter plates provided for the A... contactors can also be used for the AF... contactors.



Dimensions (mm)

Type of the plate	Dimensions			Fixing holes
	L	l	h	mm
PR110-1	151	106	11.2	2 x ø 7
PR145-1	180	122	11.5	4 x ø 7
PR210-1	200	132	11.5	4 x ø 7
PR300-1	200	172	11.5	4 x ø 7
PR460-1	278	198	11.5	4 x ø 7
PR750-1	283	244	11.5	4 x ø 7
PR185-2	202	152	11.2	4 x ø 11
PR300-2	202	152	11.2	4 x ø 11
PR400-2	278	151	11.5	4 x ø 11
PR460-2	278	176	11.5	4 x ø 11
PR580-2	283	176	11.5	4 x ø 11
PR750-2	283	255	11.5	4 x ø 14

Note: The adapter plates provided for the A... contactors can also be used for the AF... contactors.
Fixing holes according to the plate types

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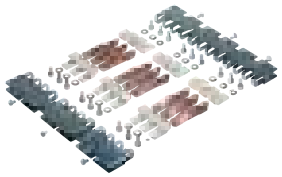
Main contact sets
Arc chutes
for 3-pole contactors

1SBC566433F0301

ZL50

1SFT980099-007 C3

ZL185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ZL1650

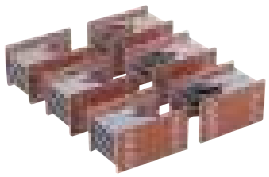
ZL..., ZLU... Main contact sets

Description

The contact sets for 3-pole contactors consists of six fixed contacts, three moving contacts, springs and the required screws.

Ordering details

For contactors	Type	Order code		Pkg qty	Weight (1 pce) kg
A/AF/AE/TAE50-30	ZL50	1SBN163503R1000		1	0.115
A/AF/AE/TAE63-30	ZL63	1SBN163703R1000		1	0.130
A/AF/AE/TAE75-30	ZL75	1SBN164103R1000		1	0.145
A/AF95-30	ZL95	1SFN164303R1000		1	0.190
A/AF110-30	ZL110	1SFN164503R1000		1	0.190
A/AF145	ZL145	1SFN164703R1000		1	0.380
A/AF185	ZL185	1SFN164903R1000		1	0.380
A/AF210	ZL210	1SFN165103R1000		1	0.670
A/AF260	ZL260	1SFN165303R1000		1	0.670
A/AF300	ZL300	1SFN165503R1000		1	0.670
AF400	ZL400	1SFN165703R1000		1	1.320
AF460	ZL460	1SFN165903R1000		1	1.320
AF580	ZL580	1SFN166103R1000		1	1.840
AF750	ZL750	1SFN166303R1000		1	1.840
AF1250	ZL1250	1SFN166403R1000		1	1.840
AF1350	ZL1350	1SFN166503R1000		1	2.500
AF1650	ZL1650	1SFN166703R1000		1	3.500
AF2050	ZL2050	1SFN167003R1000		1	3.500
UA50	ZLU50	1SBN163502R1000		1	0.115
UA63	ZLU63	1SBN163702R1000		1	0.145
UA75	ZLU75	1SBN164102R1000		1	0.145
UA95	ZLU95	1SFN164302R1000		1	0.190
UA110	ZLU110	1SFN164502R1000		1	0.190


1SFT980099-018

ZW...

ZW... Arc chutes for 3-pole contactors

Ordering details

For contactors	Type	Order code		Pkg qty	Weight (1 pce) kg
A145 ... A185 and AF145 ... AF185	ZW185	1SFN164710R1000		1	0.360
A210 ... A300 and AF210 ... AF300	ZW300	1SFN165110R1000		1	0.410
AF400, AF460	ZW460	1SFN165710R1000		1	1.380
AF580, AF750, AF1250	ZW750	1SFN166110R1000		1	1.500
AF1350, AF1650, AF2050	ZW1650	1SFN166510R1000		1	4.000

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Contactor coils

ZA16

ZA185

Description

Coils for A40 ... A300, UA16 ... UA110 and UA16..RA ... UA110..RA AC operated contactors.

Ordering details

For contactors	Rated control circuit voltage Uc		Type	Order code		Pkg qty	Weight (1 pce)
	V 50 Hz	V 60 Hz					kg
UA16, UA16..RA	24	24	ZA16	1SBN151410R8106		1	0.093
	48	48	ZA16	1SBN151410R8306		1	0.093
	110	110...120	ZA16	1SBN151410R8406		1	0.093
	220...230	230...240	ZA16	1SBN151410R8006		1	0.093
	230...240	240...260	ZA16	1SBN151410R8806		1	0.093
	380...400	400...415	ZA16	1SBN151410R8506		1	0.093
	400...415	415...440	ZA16	1SBN151410R8606		1	0.093
A40 UA26, UA30, UA26..RA, UA30..RA	24	24	ZA40	1SBN152410R8106		1	0.148
	48	48	ZA40	1SBN152410R8306		1	0.148
	110	110...120	ZA40	1SBN152410R8406		1	0.148
	220...230	230...240	ZA40	1SBN152410R8006		1	0.148
	230...240	240...260	ZA40	1SBN152410R8806		1	0.148
	380...400	400...415	ZA40	1SBN152410R8506		1	0.148
	400...415	415...440	ZA40	1SBN152410R8606		1	0.148
A45 ... A75 UA50 ... UA75 UA50..RA ... UA75..RA GA75	24	24	ZA75	1SBN153510R8106		1	0.166
	48	48	ZA75	1SBN153510R8306		1	0.166
	110	110...120	ZA75	1SBN153510R8406		1	0.166
	220...230	230...240	ZA75	1SBN153510R8006		1	0.166
	230...240	240...260	ZA75	1SBN153510R8806		1	0.166
	380...400	400...415	ZA75	1SBN153510R8506		1	0.166
	400...415	415...440	ZA75	1SBN153510R8606		1	0.166
A95, A110 UA95, UA110 UA95..RA, UA110..RA	24	24	ZA110	1SFN154310R8106		1	0.170
	48	48	ZA110	1SFN154310R8306		1	0.170
	110	110...120	ZA110	1SFN154310R8406		1	0.170
	220...230	230...240	ZA110	1SFN154310R8006		1	0.170
	230...240	240...260	ZA110	1SFN154310R8806		1	0.170
	380...400	400...415	ZA110	1SFN154310R8506		1	0.170
	400...415	415...440	ZA110	1SFN154310R8606		1	0.170
A145 ... A185	24	24	ZA185	1SFN154710R8106		1	0.180
	48	48	ZA185	1SFN154710R8306		1	0.180
	110	110...120	ZA185	1SFN154710R8406		1	0.180
	220...230	230...240	ZA185	1SFN154710R8006		1	0.180
	230...240	240...260	ZA185	1SFN154710R8806		1	0.180
	380...400	400...415	ZA185	1SFN154710R8506		1	0.180
	400...415	415...440	ZA185	1SFN154710R8606		1	0.180
A210 ... A300	24	24	ZA300	1SFN155110R8106		1	0.400
	48	48	ZA300	1SFN155110R8306		1	0.400
	110	110...120	ZA300	1SFN155110R8406		1	0.400
	220...230	230...240	ZA300	1SFN155110R8006		1	0.400
	230...240	240...260	ZA300	1SFN155110R8806		1	0.400
	380...400	400...415	ZA300	1SFN155110R8506		1	0.400
	400...415	415...440	ZA300	1SFN155110R8606		1	0.400

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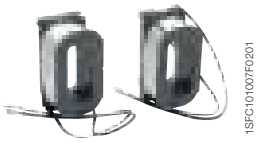
Contactor coils

ZAF110

ZAF300



ZAF1650

Description

Coils for AF45 ... AF2050 AC / DC operated contactors.

Ordering details

For contactors	Rated control circuit voltage Uc min. ... Uc max.		Type	Order code		Pkg qty	Weight (1 pce)
	V 50/60 Hz	V DC					kg
AF45 ... AF75	-	20...60	ZAF75	1SBN153570R7206		1	0.170
	48...130	48...130	ZAF75	1SBN153570R6906		1	0.170
	100...250	100...250	ZAF75	1SBN153570R7006		1	0.170
AF95, AF110	-	20...60	ZAF110	1SFN154370R7206		1	0.200
	48...130	48...130	ZAF110	1SFN154370R6906		1	0.200
	100...250	100...250	ZAF110	1SFN154370R7006		1	0.200
AF145, AF185	-	20...60	ZAF185	1SFN154770R7206		1	0.225
	48...130	48...130	ZAF185	1SFN154770R6906		1	0.225
	100...250	100...250	ZAF185	1SFN154770R7006		1	0.225
AF210 ... AF300	-	20...60	ZAF300	1SFN155170R7206		1	0.450
	48...130	48...130	ZAF300	1SFN155170R6906		1	0.450
	100...250	100...250	ZAF300	1SFN155170R7006		1	0.450
AF400, AF460	-	24...60	ZAF460	1SFN155770R6806		1	0.525
	48...130	48...130	ZAF460	1SFN155770R6906		1	0.525
	100...250	100...250	ZAF460	1SFN155770R7006		1	0.525
	250...500	250...500	ZAF460	1SFN155770R7106		1	0.525
AF580 ... AF1250	-	24...60	ZAF750	1SFN156170R6806		1	1.335
	48...130	48...130	ZAF750	1SFN156170R6906		1	1.335
	100...250	100...250	ZAF750	1SFN156170R7006		1	1.335
	250...500	250...500	ZAF750	1SFN156170R7106		1	1.335
AF1350 ... AF2050	100...250	100...250	ZAF1650 (1)	1SFN156570R7026		1 set	0.900
			ZP1650 (2)	1SFN166521R1070		1	0.300

(1) One set of two coil.
(2) Printed circuit board.

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Accessories for EK100 ... EK1000 contactors

Auxiliary contact blocks **5**/148
Terminal shrouds **5**/149
Surge suppressors for contactor coils **5**/150
Mounting plates **5**/151
Connection sets **5**/152
Mechanical interlock units **5**/153
Mechanical and electrical interlock units **5**/153
Main contact sets - Arc chutes **5**/154
Contactor coils **5**/155

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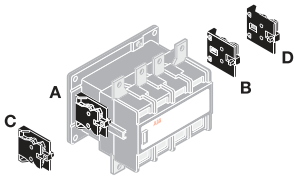
Auxiliary contact blocks



E2074D

Mounting positions of the CAL16-11

Description

The auxiliary contact blocks are used for the operation of auxiliary circuits and control circuits.

Types of auxiliary contact blocks for standard industrial environments:

– CAL instantaneous with N.O. + N.C. contacts
– CCL N.O. leading contact + N.C. lagging contact.

The auxiliary contact blocks are equipped with screw type connecting terminals delivered open, protected against accidental direct contact, and bear the corresponding function marking.
Mounting: Screwed onto the right and / or lefthand side of the EK110 ... EK1000 contactors.

Ordering details

For contactors	Number of blocks	Auxiliary contacts				Type	Order code		Pkg qty	Weight (1 pce)
										kg
2-pole auxiliary contacts N.O. + N.C.										
EK	1	1	1	–	–	CAL16-11A	SK829002-A		1	0.050
	1	1	1	–	–	CAL16-11B	SK829002-B		1	0.050
	1	1	1	–	–	CAL16-11C	SK829002-C		1	0.050
	1	1	1	–	–	CAL16-11D	SK829002-D		1	0.050
	1	1	–	–	1	CCL16-11E (1)	SK829002-E		1	0.050

(1) Mounting of CCL16-11E blocks does not allow an additional second block to be added on top of it.
All DC operated EK... contactors are equipped with one CCL16-11E on the right side.

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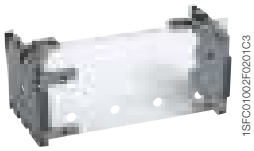
Terminal shrouds



LT210-EK

Description

The use of terminal shrouds on the main terminals of EK... contactors is required in electrical panels or cubicles to be built in compliance with the rules for protection against direct contact with live parts in acc. with EN 50274.
On EK110 ... EK1000 contactors:

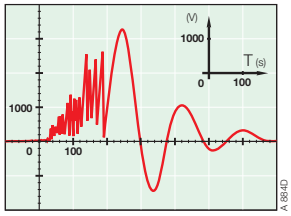
- The auxiliary contact blocks and coils are designed to provide an IP20 degree of protection
- The main terminals, equipped with lugs or connectors, can be protected against accidental direct contact after wiring (EN 50274) by the addition of terminal shrouds (see table below).

Each terminal shroud protects all the terminals on one side of the contactor. Two terminal shrouds should be provided for each separate contactor.

Ordering details

For contactors	Type	Order code		Pkg qty	Weight (1 pce) kg
EK110, EK150	LT150-EK	SK178001-HB		1	0.139
EK175, EK210	LT210-EK	SK178001-KB		1	0.152
EK370, EK550	LT550-EK	SK178001-LB		1	0.190
EK1000	LT1000-EK	SK178001-MB		1	0.200

Surge suppressors for contactor coils



Description

The operation of inductive circuits causes overvoltages, in particular on opening of the contactor coil.
The electromagnetic energy stored in the coil during contactor closing is restored on opening in the form of surges, the slope and amplitude of which may rise to several kilovolts. A number of drawbacks are observed ranging from interference on the electronic devices to breakdown of insulators and even destruction of certain sensitive components.
The graph opposite reproduces the oscillogram showing voltage discharges at the terminals of a 42 V / 50 Hz coil without peak clipping. The coil was switched by 8 series-connected poles of a contactor relay.
Following a burst of discharges with a very steep slope a damped oscillation emerges with a peak value of 3500 V.

Overvoltage Factor

The overvoltage factor k is defined as the ratio of the maximum overvoltage peak value Ûs to the peak value Ûc of the coil rated control voltage Uc:

$$k = \frac{\hat{U}s\ max.}{\hat{U}c} \qquad \text{in DC: } k = \frac{\hat{U}s\ max.}{Uc} \qquad \text{or in AC: } k = \frac{\hat{U}s\ max.}{Uc\sqrt{2}}$$

For example the following is obtained for the above graph: $k = \frac{3500}{42\ \sqrt{2}} \approx 60$

To reduce the harmful effects of these overvoltages, ABB has developed a range of surge suppressors designed to reduce the k factor defined above and to limit or even completely eliminate the high pre-damping voltage frequencies.
Each case is different, but the technical data tolerances and the generous sizing of parts have enabled us to reduce the number of variants.
We have chosen the following solutions: transil diodes, varistors and RC blocks.
Note: A varistor is a resistor whose value decreases to a very large extent when a certain voltage is applied at its terminals.

RC-EH300/48

Ordering details

For contactors	Rated control circuit voltage Uc			Type	Order code		Pkg qty	Weight (1 pce)
	V	AC	DC					kg
EK110 ... EK210	24...48	●	–	RC-EH300/48	SK829007-A		1	0.015
	110...415	●	–	RC-EH300/415	SK829007-B		1	0.015
EK370 ... EK1000	48...110	●	–	RC-EH800/110	SK829007-C		1	0.015
EK110 ... EK1000	24...125	–	●	RC-EH800/110	SK829007-C		1	0.015
EK370 ... EK1000	220...600	●	–	RC-EH800/600	SK829007-D		1	0.015

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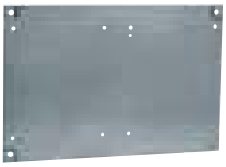
Mounting plates



PN...

Description

Mounting plates for two horizontal mounted contactors with or without a mechanical interlock unit.

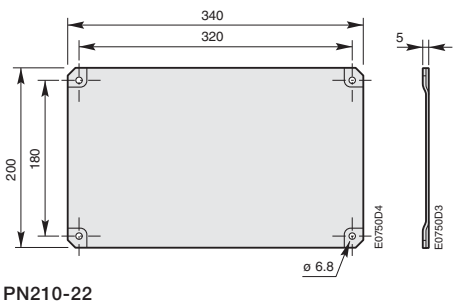
Ordering details

To use with: Left hand contactor	Mechanical interlock	Right hand contactor	Type	Order code		Pkg qty	Weight (1 pce) kg
EK110, EK150	VH145	EK110, EK150	PN210-22	SK829075-C		1	1.400
EK175, EK210	VH300	EK175, EK210	PN300-22	SK829075-E		1	2.070

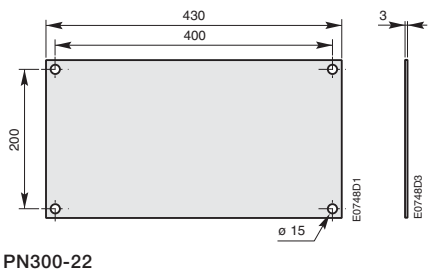
(1) Space for mechanical interlock included.

5

Main dimensions mm



PN210-22



PN300-22

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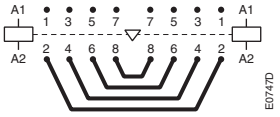
Connection sets



BSS100 ... BSS1000

Description

Connection between the main poles of two 4-pole contactors mounted side by side so that they operate as source reversing contactors.

These sets are made up of four downstream connections.
BSS100 ... BSS210 – Insulated, flexible copper bars.
BSS550, BSS1000 – Bare, solid copper bars.

Ordering details

For contactors	Type	Order code		Pkg qty	Weight (1 pce) kg
Mechanical and electrical interlock units for two horizontal mounted contactors					
EK110	BSS100	SK829090-B		1	0.400
EK150	BSS145	SK829090-F		1	0.700
EK175, EK210	BSS210	SK829090-G		1	1.000
EK370, EK550	BSS550	SK829090-E		1	3.300
EK1000	BSS1000	SK829090-H		1	5.500

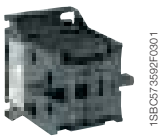
5

Mechanical interlock units
Mechanical and electrical interlock units

Description

The mechanical interlock unit prevents one of the contactors from closing as long as the other contactor is closed.

– VH145, VH300 interlock units for mechanical and electrical interlocking of two horizontal mounted AC or DC operated EK110 ... EK1000 contactors.
– VH800 interlock unit for mechanical interlocking of two horizontal mounted AC or DC operated EK370 ... EK1000 contactors.



VH145

Ordering details

Mechanical and electrical interlock units for two horizontal mounted contactors

For contactors	Type	Order code		Pkg qty	Weight (1 pce) kg
EK110, EK150	VH145	SK829071-A		1	0.130
EK175, EK210	VH300	SK829071-B		1	0.130

Mechanical interlock unit for two horizontal mounted contactors

EK370 ... EK1000	VH800	SK829070-F		1	6.000

Selection table

For contactors				
Left	**Right**	EK110, EK150	EK175, EK210	EK370 ... EK1000
EK110, EK150		VH145	–	–
EK175, EK210		–	VH300	–
EK370 ... EK1000		–	–	VH800
Fixing		PN210-22 mounting plate (to be supplied separately)	PN300-22 mounting plate (to be supplied separately)	Mounting plate included

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KZK... Main contact sets
KWK... Arc chutes

KZK370

KZK main contact sets

Description

The contact sets for 4-pole contactors consist of eight fixed contacts, four moving contacts, springs and the necessary screws. In addition, the sets include four moving arcing contacts for EK370 ... EK1000 contactors.

Ordering details

For contactors	Type	Order code		Pkg qty	Weight (1 pce) kg
EK110	KZK110	SK824204-A		1	0.450
EK150	KZK150	SK824204-B		1	0.450
EK175	KZK175	SK825204-A		1	0.700
EK210	KZK210	SK825204-B		1	0.700
EK370	KZK370	SK827204-A		1	2.400
EK550	KZK550	SK827204-B		1	2.400
EK1000	KZK1000	SK827204-F		1	3.000

Arc chutes

Description

The arc chutes sets for EK 4-pole contactors contain 8 pieces.

Ordering details

For contactors	Type	Order code		Pkg qty	Weight (1 pce) kg
EK110	KWK110	5223351-AH		1	0.660
EK150	KWK150	5223351-AK		1	0.660
EK175	KWK175	5223351-AL		1	1.260
EK210	KWK210	5223351-AM		1	1.260
EK370	KWK370	5223351-Y		1	3.170
EK550	KWK550	5223351-Z		1	3.170
EK1000	KWK1000	5223351-AN		1	3.170

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Contactor coils

KH300

Description

Coils for EK110 ... EK1000 - AC operated.

Ordering details

For contactors	Rated control circuit voltage Uc (1)		Type	Order code		Pkg qty	Weight (1 pce)
	V 50 Hz	V 60 Hz					kg
EK110 ... EK150	48	-	KH210	SK825400-AD		1	0.360
	-	110	KH210	SK825400-AE		1	0.360
	110	120	KH210	SK825400-AF		1	0.360
	220...230	-	KH210	SK825400-AL		1	0.360
	230...240	-	KH210	SK825400-AM		1	0.360
	-	380	KH210	SK825400-AN		1	0.360
	380...400	440	KH210	SK825400-AP		1	0.360
	400...415	-	KH210	SK825400-AR		1	0.360
EK175 ... EK210	48	-	KH300	SK826400-AD		1	0.440
	-	110	KH300	SK826400-AE		1	0.440
	110	120	KH300	SK826400-AF		1	0.440
	220...230	-	KH300	SK826400-AL		1	0.440
	230...240	-	KH300	SK826400-AM		1	0.440
	-	380	KH300	SK826400-AN		1	0.440
	380...400	440	KH300	SK826400-AP		1	0.440
	400...415	-	KH300	SK826400-AR		1	0.440
EK370 ... EK1000	48	-	KH800	SK828100-AD		1	0.950
	110	110...120	KH800	SK828100-EF		1	0.950
	110...115	115...127	KH800	SK828100-EG		1	0.950
	220	220...240	KH800	SK828100-EL		1	0.950
	220...230	230...255	KH800	SK828100-EM		1	0.950
	380	380...415	KH800	SK828100-EP		1	0.950
	380...400	400...440	KH800	SK828100-ER		1	0.950
	400...415	-	KH800	SK828100-AR		1	0.950

(1) Other control voltages, see voltage code table.

Contactor coils

Description

– Coils for EK110 ... EK1000 - DC operated with sets including a DC coil, an economy resistor and a insertion contact.
– Coils for EK110 ... EK210 - Multi-frequency coil and an insertion contact for contactor with built-in rectifier.

Ordering details

For contactors	Rated control circuit voltage Uc (1) V DC	Type	Order code		Pkg qty	Weight (1 pce) kg
EK110 ... EK150	12	KP210	SK825450-DA		1 set	0.450
	24	KP210	SK825450-DB		1 set	0.450
	36	KP210	SK825450-DC		1 set	0.450
	48	KP210	SK825450-DD		1 set	0.450
	60	KP210	SK825450-DT		1 set	0.450
	75	KP210	SK825450-DG		1 set	0.450
	110	KP210	SK825450-DE		1 set	0.450
	125	KP210	SK825450-DU		1 set	0.450
	220	KP210	SK825450-DF		1 set	0.450
EK175 ... EK210	12	KP300	SK826450-DA		1 set	0.550
	24	KP300	SK826450-DB		1 set	0.550
	36	KP300	SK826450-DC		1 set	0.550
	48	KP300	SK826450-DD		1 set	0.550
	60	KP300	SK826450-DT		1 set	0.550
	75	KP300	SK826450-DG		1 set	0.550
	110	KP300	SK826450-DE		1 set	0.550
	125	KP300	SK826450-DU		1 set	0.550
	220	KP300	SK826450-DF		1 set	0.550
EK3700 ... EK1000	24	KP800	SK828150-DB		1 set	1.060
	36	KP800	SK828150-DC		1 set	1.060
	48	KP800	SK828150-DD		1 set	1.060
	60	KP800	SK828150-DT		1 set	1.060
	75	KP800	SK828150-DG		1 set	1.060
	110	KP800	SK828150-DE		1 set	1.060
	125	KP800	SK828150-DU		1 set	1.060
	220	KP800	SK828150-DF		1 set	1.060

Ordering details

For contactors	Rated control circuit voltage Uc (1) V AC 40...400 Hz	Type	Order code		Pkg qty	Weight (1 pce) kg
EK110 ... EK150	110...120	KP210	SK825450-EF		1 set	0.450
	115...127	KP210	SK825450-EG		1 set	0.450
	220...230	KP210	SK825450-EL		1 set	0.450
	230...240	KP210	SK825450-EM		1 set	0.450
	380...400	KP210	SK825450-EP		1 set	0.450
	400...415	KP210	SK825450-ER		1 set	0.450
EK175 ... EK210	110...120	KP300	SK826450-EF		1 set	0.450
	115...127	KP300	SK826450-EG		1 set	0.450
	220...230	KP300	SK826450-EL		1 set	0.450
	230...240	KP300	SK826450-EM		1 set	0.450
	380...400	KP300	SK826450-EP		1 set	0.450
	400...415	KP300	SK826450-ER		1 set	0.450

(1) Other control voltages, see voltage code table.

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Voltage code table

The below tables indicate the available coil voltages and corresponding digits for order codes. When placing an order, please give the order code. Select a standard contactor from ordering detail pages. Change the **coil voltage code** in the order code according to the table below. Example: for contactor A50-30-00 and coil 42 V 50/60 Hz, the order code is 1SBL351001R**82**00.

Contactors

Auxiliary contacts N.O. N.C.

Type A40 - 30 - 10 (N.O. N.C. Main contacts)

Order code 1SBL321001R 80 10

Contactor type	
A	AC operated
AL, AE	DC operated
TAL, TAE (1)	DC operated large coil voltage range
AF, NF, GAF (1)	AC / DC operated with electronic coil interface
UA, UA..RA	Capacitor switching - AC operated
GA	DC switching - AC operated
GAE	DC switching - DC operated
AM (1)	Magnetically latched - DC operated

(1) TAL, TAE, AF, NF, GAF, AM all coil codes included in ordering detail pages.

AC coil code
Contactors: A, UA, UA..RA, GA

	50 Hz	60 Hz
81	**24 V**	**24 V**
16	26 V	28 V
17	28 V	32 V
82	**42 V**	**42 V**
20	42 V	48 V
83	**48 V**	**48 V**
73	**60 V**	**60 V**
74	**100 V** (2)	**100**...110 V (2)
26	105 V (2)	110...127 V (2)
84	**110 V**	**110**...120 V
89	110...**115 V**	**115**...127 V (3)
29	120 V	140 V
30	125...127 V	150 V
34	175 V	208 V
36	190 V	220 V
40	210 V	240 V
80	220...**230 V**	**230**...240 V
88	230...**240 V**	**240**...260 V
42	230...240 V	277 V
85	380...**400 V**	**400**...415 V
86	400...**415 V**	**415**...440 V
50	400 V	440 V
51	400...415 V	480 V
87	415...**440 V**	**440**...460 V
53	440 V	500 V
55	500 V	600 V
56	550 V	–
58	660...690 V	–
59	–	690 V

DC coil code
Contactors: AL, AE, GAE

80	12 V
81	24 V
82	42 V
83	48 V
21	50 V
84	60 V
85	75 V
86	110 V
87	125 V
88	220 V
89	240 V
38	250 V

Codes in bold for dual frequency coils.
(2) Not for A145 ... A300 contactors.
(3) A145 ... A300 contactors at 60 Hz 115 V only.

EK contactors

Auxiliary contacts N.O. N.C.

Type EK110 - 40 - 11 (N.O. N.C. Main contacts)

Order code SK824440 - AD

Contactor type	
EK	AC operated or DC operated

AC coil code
Contactors: EK110 ... EK210

	50 Hz	60 Hz
AA	–	24 V
AB	24 V	–
AC	–	48 V
AD	**48 V**	**–**
AE	–	110 V
AF	110 V	120 V
AG	127 V	–
AZ	–	208 V
AH	190 V	220 V
AK	–	240 V
AL	220...230 V	–
AM	230...240 V	–
AN	–	380 V
AP	380...400 V	440 V
AR	400...415 V	–
AS	–	480 V
AT	440 V	–
AU	500 V	–
AV	–	600 V

AC coil code
Contactors: EK370 ... EK1000

	50 Hz	60 Hz
AD	48 V	–
AE	–	110 V
AF	110 V	120 V
AG	127 V	–
AZ	–	208 V
AH	190 V	220 V
AK	–	240 V
AL	220...230 V	240 V
AM	230...240 V	–
AN	–	380 V
AP	380...400 V	440 V
AR	400...415 V	–
AS	–	480 V
AT	440 V	–
AU	500 V	–
AV	–	600 V

DC coil code
Contactors: EK110 ... EK1000

DA	12 V (4)
DB	24 V
DC	36 V
DD	48 V
DT	60 V
DG	75 V
DE	110 V
DU	125 V
DF	220 V

(4) Not for EK370 ... EK1000 contactors.

Multi-frequency coil code
Contactors: EK110 ... EK210

	40...400 Hz
EF	110...120 V
EG	115...127 V
EL	220...230 V
EM	230...240 V
EP	380...400 V
ER	400...415 V

Dual frequency coil code
Contactors: EK370 ... EK1000

	50 Hz	60 Hz
EF	110 V	110...120 V
EG	110...115 V	115...127 V
EL	220 V	220...240 V
EM	220...230 V	230...255 V
EP	380 V	380...415 V
ER	380...400 V	400...440 V

2 auxiliary contact blocks maximum per contactor, ambient temperature ≤ 55 °C and mounting positions 2 and 6 excluded.

1SBC101601S0201

Somm_OR

Overload relays

Thermal overload relays

T16 (0.10 ... 16.0 A)

Ordering details **6**/2
Technical data **6**/3

TF42 (0.10 ... 38.0 A)

Ordering details **6**/6
Technical data **6**/7

TA25DU (0.10 ... 32.0 A)

Ordering details **6**/10
Technical data **6**/11
Accessories **6**/14

TA42DU (18.0 ... 42.0 A)

Ordering details **6**/15
Technical data **6**/16

TA75DU (18 ... 80 A)

Ordering details **6**/19
Technical data **6**/20

TA80DU (29 ... 80 A)

Ordering details **6**/23
Technical data **6**/24

TA110DU (66 ... 110 A)

Ordering details **6**/27
Technical data **6**/28

TA200DU (66 ... 200 A)

Ordering details **6**/31
Technical data **6**/32

TA450DU (130 ... 310 A)

Ordering details **6**/35
Technical data **6**/36

Electronic overload relays

E16DU, E45DU, E80DU, E140DU (0.10 to 140 A)

Ordering details **6**/39
Technical data **6**/40
Accessories **6**/43

EF19, EF45 (0.10 to 45.0 A)

Ordering details **6**/44
Technical data **6**/45

E200DU, E320DU (60 to 320 A)

Ordering details **6**/48
Technical data **6**/49

E500DU, E800DU, E1250DU (150 to 1250 A)

Ordering details **6**/51
Technical data **6**/52

Somm_OR

T16 thermal overload relays
0.10 … 16.0 A

2CDC231012F0011

T16-16

2CDC235002F0011

T16 + DB16

2CDC231002F0011

DB16

Description

The T16 thermal overload relays are economic electromechanical protection devices for the main circuit. They offer reliable protection for motors in the event of overload or phase failure. The devices have trip class 10.

The thermal overload relays are three pole relays with bimetal tripping elements. The motor current flows through the bimetal tripping elements and heats them directly and indirectly. In case of an overload (over current), the bimetal elements bent as a result of the heating. This leads to a release of the relay and a change of the contacts switching position (95-96 / 97-98).

– Manual or automatic reset selectable
– Phase loss sensitive acc. to IEC/EN 60947-4-1
– Two electrically isolated auxiliary contacts – 1 N.O. + 1 N.C.
– TEST and STOP function – Trip indication on the front
– Temperature compensation
– Suitable for three- and single-phase applications

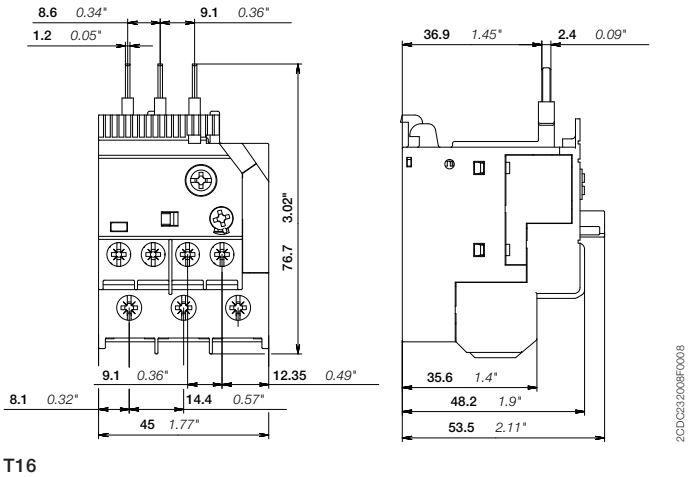
Ordering details

Setting range A	Short-circuit protective device	Trip class	Type	Order code		Weight (1 pce) kg
0.10 ... 0.13	0.5 A, Fuse type T	10	T16-0.13	1SAZ711201R1005		0.100
0.13 ... 0.17	1.0 A, Fuse type T	10	T16-0.17	1SAZ711201R1008		0.100
0.17 ... 0.23	1.0 A, Fuse type T	10	T16-0.23	1SAZ711201R1009		0.100
0.23 ... 0.31	1.0 A, Fuse type T	10	T16-0.31	1SAZ711201R1013		0.100
0.31 ... 0.41	2.0 A, Fuse type gG	10	T16-0.41	1SAZ711201R1014		0.100
0.41 ... 0.55	2.0 A, Fuse type gG	10	T16-0.55	1SAZ711201R1017		0.100
0.55 ... 0.74	4.0 A, Fuse type gG	10	T16-0.74	1SAZ711201R1021		0.100
0.74 ... 1.00	6.0 A, Fuse type gG	10	T16-1.0	1SAZ711201R1023		0.100
1.00 ... 1.30	6.0 A, Fuse type gG	10	T16-1.3	1SAZ711201R1025		0.100
1.30 ... 1.70	10.0 A, Fuse type gG	10	T16-1.7	1SAZ711201R1028		0.100
1.70 ... 2.30	10.0 A, Fuse type gG	10	T16-2.3	1SAZ711201R1031		0.100
2.30 ... 3.10	10.0 A, Fuse type gG	10	T16-3.1	1SAZ711201R1033		0.100
3.10 ... 4.20	20.0 A, Fuse type gG	10	T16-4.2	1SAZ711201R1035		0.100
4.20 ... 5.70	20.0 A, Fuse type gG	10	T16-5.7	1SAZ711201R1038		0.100
5.70 ... 7.60	35.0 A, Fuse type gG	10	T16-7.6	1SAZ711201R1040		0.100
7.60 ... 10.0	35.0 A, Fuse type gG	10	T16-10	1SAZ711201R1043		0.104
10.0 ... 13.0	40.0 A, Fuse type gG	10	T16-13	1SAZ711201R1045		0.104
13.0 ... 16.0	40.0 A, Fuse type gG	10	T16-16	1SAZ711201R1047		0.104

Ordering details accessories

For thermal overload relays	Description	Type	Order code		Weight (1 pce) kg
T16	Single mounting kit	DB16	1SAZ701901R0001		0.032

Main dimensions mm, *inches*



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T16

2CDC106036C0201

T16 thermal overload relays
Technical data

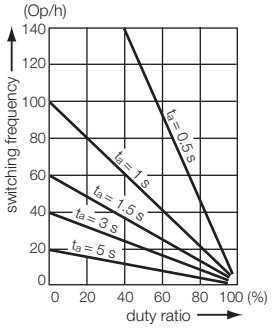
Main circuit – Utilization characteristics according to IEC/EN

Type	T16
Standards	IEC/EN 60947–4–1, IEC/EN 60947-5-1, IEC/EN 60947-1
Rated operational voltage U_e	690 V AC - V DC
Rated frequency	50/60 Hz
Trip class	10
Number of poles	3
Duty time	100 %
Operating frequency without early tripping	Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty"
Rated impulse withstand voltage U_{imp}	6 kV
Rated insulation voltage U_i	690 V AC

Auxiliary circuit according to IEC/EN

Type		T16
Rated operational voltage U_e		600 V
Conventional free air thermal current I_{th}	N.C., 95-96	6 A
	N.O., 97-98	4 A
Rated frequency		DC, 50/60 Hz
Number of poles		1 N.O. + 1 N.C.
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category		
110-120 V	N.C., 95-96	3.00 A
	N.O., 97-98	0.75 A
220-230-240 V	N.C., 95-96	3.00 A
	N.O., 97-98	0.75 A
440 V	N.C., 95-96	0.75 A
	N.O., 97-98	0.75 A
480-500 V	N.C., 95-96	0.75 A
	N.O., 97-98	0.75 A
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category		
24 V	N.C., 95-96	1.25 A
	N.O., 97-98	1.25 A
60 V	N.C., 95-96	0.55 A
	N.O., 97-98	0.55 A
110-120-125 V	N.C., 95-96	0.55 A
	N.O., 97-98	0.55 A
250 V	N.C., 95-96	0.27 A
	N.O., 97-98	0.27 A
Minimum switching capacity		17 V / 3 mA
Short-circuit protective device	N.C., 95-96	6 A, Fuse type gG
	N.O., 97-98	4 A, Fuse type gG
Rated impulse withstand voltage U_{imp}		6 kV
Rated insulation voltage U_i		690 V

Technical diagram – Intermittent periodic duty



t_a: Motor starting time

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T16 thermal overload relays
Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type		T16
Standards		UL 508, CSA 22.2 No. 14
Maximum operational voltage		600 V AC
Trip rating		125 % of FLA
Full load amps (FLA)		See table "Full load amps and short-circuit protective device"
Short-circuit rating RMS symmetrical		See table "Full load amps and short-circuit protective device"
Short-circuit protective device		See table "Full load amps and short-circuit protective device"

Auxiliary circuit according to UL/CSA

Type		T16
Contact rating	N.C., 95-96	B600, Q300
	N.O., 97-98	D300, Q300
Conventional thermal current	N.C., 95-96	5 A
	N.O., 97-98	2.5 A

6

Full load amps and short-circuit protective device

Type	Full load amps (FLA)	Short-circuit protective device			
		480 / 600 V AC		480 / 600 V AC	
		Short circuit rating RMS symmetrical	Fuse type	Short circuit rating RMS symmetrical	Fuse type
T16-0.13	0.13 A	18 kA	1 A, K5	100 kA	30 A, Class J
T16-0.17	0.17 A	18 kA	1 A, K5	100 kA	30 A, Class J
T16-0.23	0.23 A	18 kA	1 A, K5	100 kA	30 A, Class J
T16-0.31	0.31 A	18 kA	3 A, K5	100 kA	30 A, Class J
T16-0.41	0.41 A	18 kA	3 A, K5	100 kA	30 A, Class J
T16-0.55	0.55 A	18 kA	3 A, K5	100 kA	30 A, Class J
T16-0.74	0.74 A	18 kA	3 A, K5	100 kA	30 A, Class J
T16-1.0	1.00 A	18 kA	6 A, K5	100 kA	30 A, Class J
T16-1.3	1.30 A	18 kA	6 A, K5	100 kA	30 A, Class J
T16-1.7	1.70 A	18 kA	6 A, K5	100 kA	30 A, Class J
T16-2.3	2.30 A	18 kA	10 A, K5	100 kA	30 A, Class J
T16-3.1	3.10 A	18 kA	10 A, K5	100 kA	30 A, Class J
T16-4.2	4.20 A	18 kA	15 A, K5	100 kA	30 A, Class J
T16-5.7	5.70 A	18 kA	20 A, K5	100 kA	30 A, Class J
T16-7.6	7.60 A	18 kA	25 A, K5	100 kA	30 A, Class J
T16-10	10.0 A	18 kA	35 A, K5	100 kA	45 A, Class J
T16-13	13.0 A	18 kA	40 A, K5	100 kA	45 A, Class J
T16-16	16.0 A	18 kA	60 A, K5	100 kA	45 A, Class J

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T16 thermal overload relays
Technical data

General technical data

Type		**T16**
Pollution degree		3
Phase loss sensitive		Yes
Ambient air temperature		
Operation	Open - compensated without derating	-25 ... +60 °C
	Open	-25 ... +60 °C
Storage		-50 ... +80 °C
Ambient air temperature compensation		Continuous
Maximum operating altitude permissible		2000 m
Resistance to shock acc. to IEC 60068-2-27		25 g / 11 ms
Resistance to vibrations acc. to IEC 60068-2-6		3 g / 3 ... 150 Hz
Mounting position		Position 1-5
Mounting		Mount on the contactor and tighten the screws of the main circuit terminals or with single mounting kit on DIN rail (35 mm)
Degree of protection		IP20

Electrical connection

Main circuit

Type			**T16**
Connecting capacity			
	Rigid	**1 x** **2 x**	0.75 ... 4 mm² 0.75 ... 1.5 mm² or 1.5 ... 4 mm² [1]
	Flexible	**1 x or 2 x**	0.75 ... 4 mm²
	Stranded acc. to UL/CSA	**1 x or 2 x**	AWG 18-10
	Flexible acc. to UL/CSA	**1 x or 2 x**	AWG 18-10
Stripping length			12 mm
Tightening torques			1.1 ... 1.5 Nm / 9 ... 13 lb.in
Connection screw			M4 (Pozidriv 2)

[1] Combination of different wires not possible

Auxiliary circuit

Type			**T16**
Connecting capacity			
	Rigid	**1 x or 2 x**	0.75 ... 4 mm²
	Flexible with ferrule	**1 x or 2 x**	0.75 ... 2.5 mm²
	Flexible with insulated ferrule	**1 x** **2 x**	0.75 ... 2.5 mm² 0.75 ... 1.5 mm²
	Flexible	**1 x or 2 x**	0.75 ... 1 mm² or 1 ... 2.5 mm²
	Stranded acc. to UL/CSA	**1 x or 2 x**	AWG 18-12
	Flexible acc. to UL/CSA	**1 x or 2 x**	AWG 18-12
Stripping length			9 mm
Tightening torques			1.1 ... 1.5 Nm / 9 ... 13 lb.in
Connection screw			M3 (Pozidriv 2)

2CDC106036C0201

TF42 thermal overload relays
0.10 … 38.0 A

TF42-38

DB42

Description

The TF42 thermal overload relays are economic electromechanical protection devices for the main circuit. They offer reliable protection for motors in the event of overload or phase failure. The devices have trip class 10.

The thermal overload relays are three pole relays with bimetal tripping elements. The motor current flows through the bimetal tripping elements and heats them directly and indirectly. In case of an overload (over current), the bimetal elements bent as a result of the heating. This leads to a release of the relay and a change of the contacts switching position (95-96 / 97-98).

– Phase loss sensitive acc. to IEC/EN 60947-4-1
– TEST and STOP function – Trip indication on the front
– Suitable for three- and single-phase applications
– Sealable cover

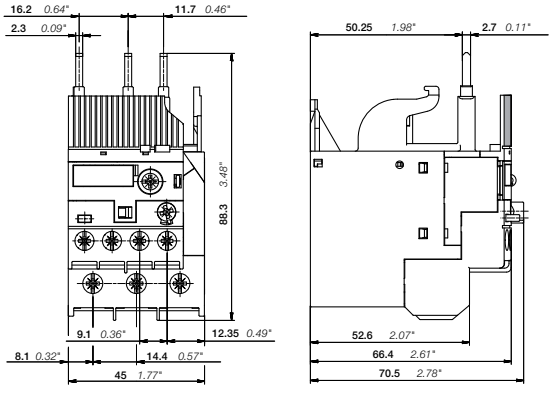
Ordering details

Setting range A	Short-circuit protective device	Trip class	Type	Order code		Weight (1 pce) kg
0.10 ... 0.13	0.5 A, Fuse type T	10	TF42-0.13	1SAZ721201R1005		0.130
0.13 ... 0.17	1.0 A, Fuse type T	10	TF42-0.17	1SAZ721201R1008		0.130
0.17 ... 0.23	1.0 A, Fuse type T	10	TF42-0.23	1SAZ721201R1009		0.130
0.23 ... 0.31	1.0 A, Fuse type T	10	TF42-0.31	1SAZ721201R1013		0.130
0.31 ... 0.41	2.0 A, Fuse type gG	10	TF42-0.41	1SAZ721201R1014		0.130
0.41 ... 0.55	2.0 A, Fuse type gG	10	TF42-0.55	1SAZ721201R1017		0.130
0.55 ... 0.74	4.0 A, Fuse type gG	10	TF42-0.74	1SAZ721201R1021		0.130
0.74 ... 1.00	6.0 A, Fuse type gG	10	TF42-1.0	1SAZ721201R1023		0.130
1.00 ... 1.30	6.0 A, Fuse type gG	10	TF42-1.3	1SAZ721201R1025		0.130
1.30 ... 1.70	10.0 A, Fuse type gG	10	TF42-1.7	1SAZ721201R1028		0.130
1.70 ... 2.30	10.0 A, Fuse type gG	10	TF42-2.3	1SAZ721201R1031		0.130
2.30 ... 3.10	10.0 A, Fuse type gG	10	TF42-3.1	1SAZ721201R1033		0.130
3.10 ... 4.20	20.0 A, Fuse type gG	10	TF42-4.2	1SAZ721201R1035		0.130
4.20 ... 5.70	20.0 A, Fuse type gG	10	TF42-5.7	1SAZ721201R1038		0.130
5.70 ... 7.60	35.0 A, Fuse type gG	10	TF42-7.6	1SAZ721201R1040		0.130
7.60 ... 10.0	35.0 A, Fuse type gG	10	TF42-10	1SAZ721201R1043		0.130
10.0 ... 13.0	40.0 A, Fuse type gG	10	TF42-13	1SAZ721201R1045		0.130
13.0 ... 16.0	40.0 A, Fuse type gG	10	TF42-16	1SAZ721201R1047		0.130
16.0 ... 20.0	63.0 A, Fuse type gG	10	TF42-20	1SAZ721201R1049		0.145
20.0 ... 24.0	63.0 A, Fuse type gG	10	TF42-24	1SAZ721201R1051		0.145
24.0 ... 29.0	63.0 A, Fuse type gG	10	TF42-29	1SAZ721201R1052		0.145
29.0 ... 35.0	80.0 A, Fuse type gG	10	TF42-35	1SAZ721201R1053		0.145
35.0 ... 38.0/40.0	80.0 A, Fuse type gG	10	TF42-38	1SAZ721201R1055		0.145

Ordering details accessories

For thermal overload relays	Description	Type	Order code		Weight (1 pce) kg
TF42	Single mounting kit	DB42	1SAZ701902R0001		0.087

Main dimensions mm, *inches*



TF42

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TF42 thermal overload relays
Technical data

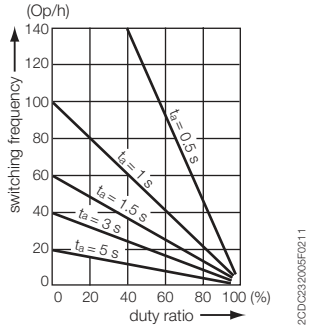
Main circuit – Utilization characteristics according to IEC/EN

Type		TF42
Standards		IEC/EN 60947–4–1, IEC/EN 60947-5-1, IEC/EN 60947-1
Rated operational voltage U_e		690 V AC
Rated frequency		50/60 Hz
Trip class		10
Number of poles		3
Duty time		100 %
Operating frequency without early tripping		Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty"
Rated impulse withstand voltage U_{imp}		6 kV
Rated insulation voltage U_i		690 V AC

Auxiliary circuit according to IEC/EN

Type		TF42
Rated operational voltage U_e		600 V
Conventional free air thermal current I_{th}	**N.C., 95-96**	6 A
	N.O., 97-98	4 A
Rated frequency		DC, 50/60 Hz
Number of poles		1 N.O. + 1 N.C.
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category		
110-120 V	**N.C., 95-96**	3.00 A
	N.O., 97-98	0.75 A
220-230-240 V	**N.C., 95-96**	3.00 A
	N.O., 97-98	0.75 A
440 V	**N.C., 95-96**	0.75 A
	N.O., 97-98	0.75 A
480-500 V	**N.C., 95-96**	0.75 A
	N.O., 97-98	0.75 A
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category		
24 V	**N.C., 95-96**	1.25 A
	N.O., 97-98	1.25 A
110-120-125 V	**N.C., 95-96**	0.55 A
	N.O., 97-98	0.55 A
250 V	**N.C., 95-96**	0.27 A
	N.O., 97-98	0.27 A
Minimum switching capacity		17 V / 3 mA
Short-circuit protective device	**N.C., 95-96**	6 A, Fuse type gG
	N.O., 97-98	4 A, Fuse type gG
Rated impulse withstand voltage U_{imp}		6 kV
Rated insulation voltage U_i		690 V

Technical diagram – Intermittent periodic duty



t_a: Motor starting time

2CDC106046C0201

TF42 thermal overload relays
Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type	TF42
Standards	UL 508, CSA 22.2 No. 14
Maximum operational voltage	600 V AC
Trip rating	125 % of FLA
Full load amps (FLA)	See table "Full load amps and short-circuit protective device"
Short-circuit rating RMS symmetrical	See table "Full load amps and short-circuit protective device"
Short-circuit protective device	See table "Full load amps and short-circuit protective device"

Auxiliary circuit according to UL/CSA

Type		TF42
Contact rating	N.C., 95-96	B600, Q300
	N.O., 97-98	D300, Q300
Conventional thermal current	N.C., 95-96	5 A
	N.O., 97-98	2.5 A

Full load amps and short-circuit protective device

Type	Full load amps (FLA)	Short-circuit protective device			
		480 / 600 V AC		480 / 600 V AC	
		Short circuit rating RMS symmetrical	Fuse type	Short circuit rating RMS symmetrical	Fuse type
TF42-0.13	0.13 A	18 kA	1 A, K5	100 kA	30 A, Class J
TF42-0.17	0.17 A	18 kA	1 A, K5	100 kA	30 A, Class J
TF42-0.23	0.23 A	18 kA	1 A, K5	100 kA	30 A, Class J
TF42-0.31	0.31 A	18 kA	3 A, K5	100 kA	30 A, Class J
TF42-0.41	0.41 A	18 kA	3 A, K5	100 kA	30 A, Class J
TF42-0.55	0.55 A	18 kA	3 A, K5	100 kA	30 A, Class J
TF42-0.74	0.74 A	18 kA	3 A, K5	100 kA	30 A, Class J
TF42-1.0	1.00 A	18 kA	6 A, K5	100 kA	30 A, Class J
TF42-1.3	1.30 A	18 kA	6 A, K5	100 kA	30 A, Class J
TF42-1.7	1.70 A	18 kA	6 A, K5	100 kA	30 A, Class J
TF42-2.3	2.30 A	18 kA	10 A, K5	100 kA	30 A, Class J
TF42-3.1	3.10 A	18 kA	10 A, K5	100 kA	30 A, Class J
TF42-4.2	4.20 A	18 kA	15 A, K5	100 kA	30 A, Class J
TF42-5.7	5.70 A	18 kA	20 A, K5	100 kA	30 A, Class J
TF42-7.6	7.60 A	18 kA	25 A, K5	100 kA	30 A, Class J
TF42-10	10.0 A	18 kA	35 A, K5	100 kA	45 A, Class J
TF42-13	13.0 A	18 kA	40 A, K5	100 kA	45 A, Class J
TF42-16	16.0 A	18 kA	60 A, K5	100 kA	45 A, Class J
TF42-20	20.0 A	18 kA	80 A, K5	100 kA	60 A, Class J
TF42-24	24.0 A	18 kA	80 A, K5	100 kA	60 A, Class J
TF42-29	29.0 A	18 kA	100 A, K5	100 kA	100 A, Class J
TF42-35	35.0 A	18 kA	150 A, K5	100 kA	175 A, Class J
TF42-38	38.0 A	18 kA	150 A, K5	100 kA	175 A, Class J

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TF42 thermal overload relays
Technical data

General technical data

Type			TF42
Pollution degree			3
Phase loss sensitive			Yes
Ambient air temperature			
	Operation	Open - compensated without derating	-25 ... +60 °C
		Open	-25 ... +60 °C
	Storage		-50 ... +80 °C
Ambient air temperature compensation			Continuous
Maximum operating altitude permissible			2000 m
Resistance to shock acc. to IEC 60068-2-27			25 g / 11 ms
Resistance to vibrations acc. to IEC 60068-2-6			3 g / 3 ... 150 Hz
Mounting position			Position 1-5
Mounting			Mount on the contactor and tighten the screws of the main circuit terminals or with single mounting kit on DIN rail (35 mm)
Degree of protection			IP20

Electrical connection

Main circuit

			TF42 (TF42-0.13 ... TF42-16)	TF42 (TF42-20 ... TF42-38)
Type				
Connecting capacity				
	Rigid	**1 x or 2 x**	0.75 ... 4 mm²	1.5 ... 2.5 mm² or 2.5 ... 10 mm² [1]
	Flexible with insulated ferrule	**1 x or 2 x**	0.75 ... 4 mm²	2.5 ... 4 mm² or 4 ... 6 mm²
	Stranded acc. to UL/CSA	**1 x or 2 x**	AWG 18-10	AWG 14-6
	Flexible acc. to UL/CSA	**1 x or 2 x**	AWG 18-10	AWG 14-6
Stripping length			12 mm	
Tightening torques			1.5 - 2.5 Nm / 13 ... 22 lb.in	2.5 - 2.7 Nm / 22 lb.in
Connection screw			M4 (Pozidriv 2)	

[1] Combination of different wires not possible

Auxiliary circuit

			TF42
Type			
Connecting capacity			
	Rigid	**1 x or 2 x**	0.75 ... 4 mm²
	Flexible with ferrule	**1 x or 2 x**	0.75 ... 2.5 mm²
	Flexible with insulated ferrule	**1 x** **2 x**	0.75 ... 2.5 mm² 0.75 ... 1.5 mm²
	Flexible	**1 x or 2 x**	0.75 ... 1 mm² or 1 ... 2.5 mm²
	Stranded acc. to UL/CSA	**1 x or 2 x**	AWG 18-12
	Flexible acc. to UL/CSA	**1 x or 2 x**	AWG 18-12
Stripping length			9 mm
Tightening torques			1.1 ... 1.5 Nm / 9 ... 13 lb.in
Connection screw			M3 (Pozidriv 2)

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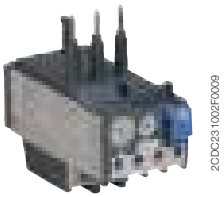
TA25DU thermal overload relays
With screw terminals - 0.10 … 32.0 A



TA25DU-0.19

Description

The TA25DU thermal overload relays are economic electromechanical protection devices for the main circuit. They offer reliable protection for motors in the event of overload or phase failure. The devices have trip class 10A.

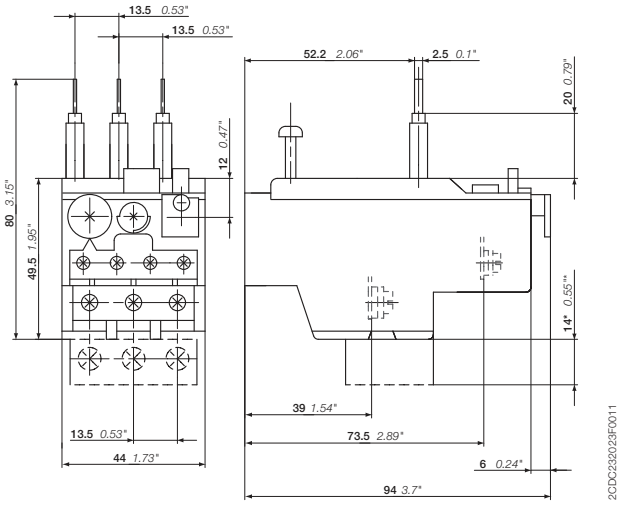
The thermal overload relays are three pole relays with bimetal tripping elements. The motor current flows through the bimetal tripping elements and heats them directly and indirectly. In case of an overload (over current), the bimetal elements bent as a result of the heating. This leads to a release of the relay and a change of the contacts switching position (95-96 / 97-98).

- Manual or automatic reset selectable
- Phase loss sensitive acc. to IEC/EN 60947-4-1
- Two electrically isolated auxiliary contacts – 1 N.O. + 1 N.C.
- TEST and STOP function – Trip indication on the front
- Temperature compensation
- Suitable for three- and single-phase applications

Ordering details

Setting range A	Short-circuit protective device	Trip class	Type	Order code		Weight (1 pce) kg
0.10 ... 0.16	0.50 A, Fuse type F	10A	TA25DU-0.16	1SAZ211201R1005		0.150
0.16 ... 0.25	0.63 A, Fuse type F	10A	TA25DU-0.25	1SAZ211201R1009		0.150
0.25 ... 0.40	1.25 A, Fuse type F	10A	TA25DU-0.4	1SAZ211201R1013		0.150
0.40 ... 0.63	2 A, Fuse type gG / -	10A	TA25DU-0.63	1SAZ211201R1017		0.150
0.63 ... 1.00	4 A, Fuse type gG / 2 A aM	10A	TA25DU-1.0	1SAZ211201R1021		0.150
1.00 ... 1.40	6 A, Fuse type gG / 2 A aM	10A	TA25DU-1.4	1SAZ211201R1023		0.150
1.30 ... 1.80	6 A, Fuse type gG / 4 A aM	10A	TA25DU-1.8	1SAZ211201R1025		0.150
1.70 ... 2.40	6 A, Fuse type gG / 4 A aM	10A	TA25DU-2.4	1SAZ211201R1028		0.150
2.20 ... 3.10	10 A, Fuse type gG / 6 A aM	10A	TA25DU-3.1	1SAZ211201R1031		0.150
2.80 ... 4.00	10 A, Fuse type gG / 6 A aM	10A	TA25DU-4.0	1SAZ211201R1033		0.150
3.50 ... 5.00	16 A, Fuse type gG / 10 A aM	10A	TA25DU-5.0	1SAZ211201R1035		0.150
4.50 ... 6.50	20 A, Fuse type gG / 16 A aM	10A	TA25DU-6.5	1SAZ211201R1038		0.150
6.00 ... 8.50	20 A, Fuse type gG / 20 A aM	10A	TA25DU-8.5	1SAZ211201R1040		0.150
7.50 ... 11.00	35 A, Fuse type gG / 25 A aM	10A	TA25DU-11	1SAZ211201R1043		0.150
10.00 ... 14.00	35 A, Fuse type gG / 25 A aM	10A	TA25DU-14	1SAZ211201R1045		0.150
13.00 ... 19.00	50 A, Fuse type gG / 35 A aM	10A	TA25DU-19	1SAZ211201R1047		0.170
18.00 ... 25.00	63 A, Fuse type gG / 50 A aM	10A	TA25DU-25	1SAZ211201R1051		0.170
24.00 ... 32.00	80 A, Fuse type gG / 63 A aM	10A	TA25DU-32	1SAZ211201R1053		0.200

Main dimensions mm, *inches*



TA25DU + DX25

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TA25DU thermal overload relays
Technical data

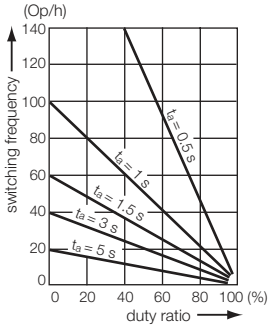
Main circuit – Utilization characteristics according to IEC/EN

Type	TA25DU
Standards	IEC/EN 60947–4–1, IEC/EN 60947-5-1, IEC/EN 60947-1
Rated operational voltage U_e	690 V AC
Rated frequency	DC, 50/60 Hz
Frequency range	0 ... 400 Hz
Trip class	10A
Number of poles	3
Duty time	100 %
Operating frequency without early tripping	Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty"
Rated impulse withstand voltage U_{imp}	6 kV
Rated insulation voltage U_i	690 V AC

Auxiliary circuit according to IEC/EN

Type		TA25DU
Rated operational voltage U_e		500 V AC, 440 V DC
Conventional free air thermal current I_{th}	N.C., 95-96	10 A
	N.O., 97-98	6 A
Rated frequency		DC, 50/60 Hz
Number of poles		1 N.O. + 1 N.C.
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category		
110-120 V	N.C., 95-96	3.00 A
	N.O., 97-98	3.00 A
220-230-240 V	N.C., 95-96	3.00 A
	N.O., 97-98	3.00 A
440 V	N.C., 95-96	1.90 A
	N.O., 97-98	1.00 A
480-500 V	N.C., 95-96	1.00 A
	N.O., 97-98	1.00 A
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category		
24 V	N.C., 95-96	1.25 A
	N.O., 97-98	1.25 A
60 V	N.C., 95-96	0.25 A
	N.O., 97-98	0.25 A
110-120-125 V	N.C., 95-96	0.25 A
	N.O., 97-98	0.25 A
250 V	N.C., 95-96	0.12 A
	N.O., 97-98	0.04 A
Minimum switching capacity		17 V / 3 mA
Short-circuit protective device	N.C., 95-96	10 A, Fuse type gG
	N.O., 97-98	6 A, Fuse type gG
Rated impulse withstand voltage U_{imp}		6 kV
Rated insulation voltage U_i		690 V

Technical diagram – Intermittent periodic duty



t_a: Motor starting time

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TA25DU thermal overload relays
Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type	TA25DU
Standards	UL 508, CSA 22.2 No. 14
Maximum operational voltage	600 V AC
Trip rating	125 % of FLA
Full load amps (FLA)	See table "Full load amps and short-circuit protective device"
Short-circuit rating RMS symmetrical	See table "Full load amps and short-circuit protective device"
Short-circuit protective device	See table "Full load amps and short-circuit protective device"

Auxiliary circuit according to UL/CSA

Type		TA25DU
Contact rating	N.C., 95-96	C600
	N.O., 97-98	B600
Conventional thermal current		5 A

Full load amps and short-circuit protective device

Type	Full load amps (FLA)	Short-circuit protective device 480 / 600 V AC			480 / 600 V AC		480 / 600 V AC	
		Short circuit rating RMS symmetrical	Fuse type	Listed circuit breaker	Short circuit rating RMS symmetrical	Listed circuit breaker	Short circuit rating RMS symmetrical	Fuse type
TA25DU-0.16	0.16 A	5 kA	1.0 A, K5 / RK5	15 A	35 / 18 kA	15 A	50 kA	30 A, Class J
TA25DU-0.25	0.25 A	5 kA	1.0 A, K5 / RK5	15 A	35 / 18 kA	15 A	50 kA	30 A, Class J
TA25DU-0.4	0.40 A	5 kA	3.0 A, K5 / RK5	15 A	35 / 18 kA	15 A	50 kA	30 A, Class J
TA25DU-0.63	0.63 A	5 kA	3.0 A, K5 / RK5	15 A	35 / 18 kA	15 A	50 kA	30 A, Class J
TA25DU-1.0	1.0 A	5 kA	6.0 A, K5 / RK5	15 A	35 / 18 kA	15 A	50 kA	30 A, Class J
TA25DU-1.4	1.4 A	5 kA	6.0 A, K5 / RK5	15 A	35 / 18 kA	15 A	50 kA	30 A, Class J
TA25DU-1.8	1.8 A	5 kA	6.0 A, K5 / RK5	15 A	35 / 18 kA	15 A	50 kA	30 A, Class J
TA25DU-2.4	2.4 A	5 kA	10 A, K5 / RK5	15 A	35 / 18 kA	15 A	50 kA	30 A, Class J
TA25DU-3.1	3.1 A	5 kA	10 A, K5 / RK5	15 A	35 / 18 kA	15 A	50 kA	30 A, Class J
TA25DU-4.0	4.0 A	5 kA	15 A, K5 / RK5	15 A	35 / 18 kA	15 A	50 kA	30 A, Class J
TA25DU-5.0	5.0 A	5 kA	20 A, K5 / RK5	20 A	35 / 18 kA	20 A	50 kA	30 A, Class J
TA25DU-6.5	6.5 A	5 kA	25 A, K5 / RK5	20 A	35 / 18 kA	20 A	50 kA	30 A, Class J
TA25DU-8.5	8.5 A	5 kA	35 A, K5 / RK5	20 A	35 / 18 kA	20 A	50 kA	30 A, Class J
TA25DU-11	11 A	5 kA	45 A, K5 / RK5	50 A	35 / 18 kA	50 A	50 kA	35 A, Class J
TA25DU-14	14 A	5 kA	60 A, K5 / RK5	50 A	35 / 18 kA	50 A	50 kA	60 A, Class J
TA25DU-19	19 A	5 kA	60 A, K5 / RK5	50 A	35 / 18 kA	50 A	50 kA	60 A, Class J
TA25DU-25	25 A	5 kA	70 A, K5 / RK5	70 A	35 / 18 kA	70 A	50 kA	100 A, Class J
TA25DU-32	32 A	5 kA	100 A, K5 / RK5	100 A	35 / 18 kA	100 A	50 kA	100 A, Class J

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TA25DU thermal overload relays
Technical data

General technical data

Type			TA25DU
Pollution degree			3
Phase loss sensitive			Yes
Ambient air temperature			
	Operation	Open - compensated without derating	-25 ... +55 °C
		Open	-25 ... +55 °C
	Storage		-40 ... +70 °C
Ambient air temperature compensation			Continuous
Maximum operating altitude permissible			2000 m
Resistance to shock acc. to IEC 60068-2-27			12 g / 15 ms
Mounting position			Position 1-6
Mounting			Mount on the contactor and tighten the screws of the main circuit terminals or with single mounting kit on DIN rail (35 mm)
Degree of protection			IP20

Electrical connection

Main circuit

Type			TA25DU (0.16-11 A)	TA25DU (14-25 A)	TA25DU (32 A)
Connecting capacity					
	Rigid	**1 x**	0.75 ... 4 mm²	1.5 ... 6 mm²	1.5 ... 10 mm²
		2 x	0.75 ... 4 mm²	1.5 ... 6 mm²	-
	Flexible with insulated ferrule	**1 x or 2 x**[1)]	0.75 ... 4 mm²	1.5 ... 4 mm²	1.5 ... 6 mm²
	Stranded acc. to UL/CSA	**1 x**	AWG 16-8	AWG 16-8	AWG 10-8
		2 x	AWG 16-8	AWG 16-8	-
	Flexible acc. to UL/CSA	**1 x**	AWG 16-8	AWG 16-8	AWG 10-8
		2 x	AWG 16-8	AWG 16-8	-
Stripping length			12 mm	12 mm	15 mm
Tightening torques			1.4 - 2.0 Nm / 12 lb.in	1.4 - 2.0 Nm / 12 lb.in	2.5 - 3.2 Nm / 20 lb.in
Connection screw			M4 (Pozidriv 2)	M4 (Pozidriv 2)	M5 (Pozidriv 2)

[1)] Combination of different wires not possible

Auxiliary circuit

Type			TA25DU
Connecting capacity			
	Rigid	**1 x or 2 x**	0.75 ... 4 mm²
	Flexible	**1 x or 2 x**	0.75 ... 2.5 mm²
	Stranded acc. to UL/CSA	**1 x or 2 x**	AWG 18-14
	Flexible acc. to UL/CSA	**1 x or 2 x**	AWG 18-14
Stripping length			9 mm
Tightening torques			0.8 ... 1.3 Nm / 12 lb.in
Connection screw			M3.5 (Pozidriv 2)

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TA25DU thermal overload relays
Accessories

SST01494

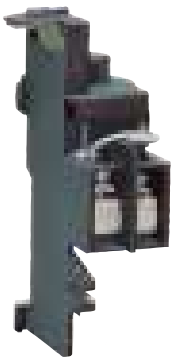
DX25

2CDC231017F0006

DB25/25A

SST20491

DS25-A-220/380


SST20591

DR25-A-220/380

Description

The single mounting kits offer the possibility to mount the overload relays separately from the contactor. The DS25-A allows electrically remote tripping of TA25DU. DR25-A coil for remote reset of TA25DU.

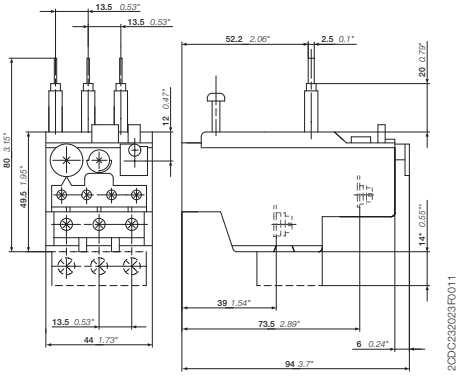
Ordering details

For thermal overload relays	Description	Type	Order code		Weight (1 pce) kg
Terminal block and mounting kits					
TA25DU-0.16 ... 25 / DB25/25 A	Terminal block 10 mm²	DX25	1SAZ201307R0002		0.030
TA25DU-0.16 ... 25	Single mounting kit	DB25/25A	1SAZ201108R0001		0.055
TA25DU-32	Single mounting kit	DB25/32A	1SAZ201108R0002		0.080
Remote tripping coil					
TA25DU	24/48 V, 50/60 Hz	DS25-A-24	1SAZ201501R0001		0.050
TA25DU	110 V, 50/60Hz	DS25-A-110	1SAZ201501R0003		0.050
TA25DU	220/380 V, 50/60 Hz	DS25-A-220/380	1SAZ201501R0005		0.050
TA25DU	500 V, 50/60Hz	DS25-A-500	1SAZ201501R0006		0.050
Remote reset coil					
TA25DU	24 V, 50/60 Hz	DR25-A-24	1SAZ201504R0001		0.050
TA25DU	48 V, 50/60 Hz	DR25-A-48	1SAZ201504R0002		0.050
TA25DU	110 V, 50/60 Hz	DR25-A-110	1SAZ201504R0003		0.050
TA25DU	220/380 V, 50/60 Hz	DR25-A-220/380	1SAZ201504R0005		0.050
TA25DU	500 V, 50/60 Hz	DR25-A-500	1SAZ201504R0006		0.050

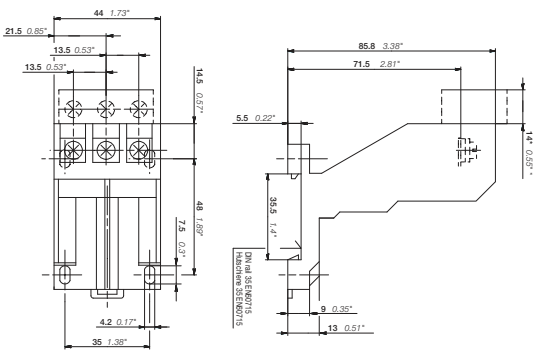
The remote tripping coil is to be connected to auxiliary contact 95-96 of TA25DU.
The coil is not suitable for Continuous operation. Impulse duration: maximum 0.2 seconds.

The remote reset coil is to be connected to auxiliary contact 97-98 of TA25DU.
The coil is not suitable for Continuous operation. Impulse duration: maximum 0.2 seconds.

Main dimensions mm, *inches*



TA25DU + DX25



DB25

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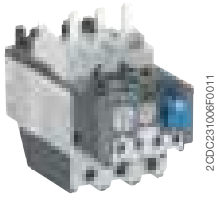
TA42DU thermal overload relays
18.0 … 42.0 A



TA42DU-32

Description

The TA42DU thermal overload relays are economic electromechanical protection devices for the main circuit. They offer reliable protection for motors in the event of overload or phase failure. The devices have trip class 10A.

The thermal overload relays are three pole relays with bimetal tripping elements. The motor current flows through the bimetal tripping elements and heats them directly and indirectly. In case of an overload (over current), the bimetal elements bent as a result of the heating. This leads to a release of the relay and a change of the contacts switching position (95-96 / 97-98).

– Manual or automatic reset selectable
– Phase loss sensitive acc. to IEC/EN 60947-4-1
– Two electrically isolated auxiliary contacts – 1 N.O. + 1 N.C.
– TEST and STOP function – Trip indication on the front
– Temperature compensation
– Suitable for three- and single-phase applications

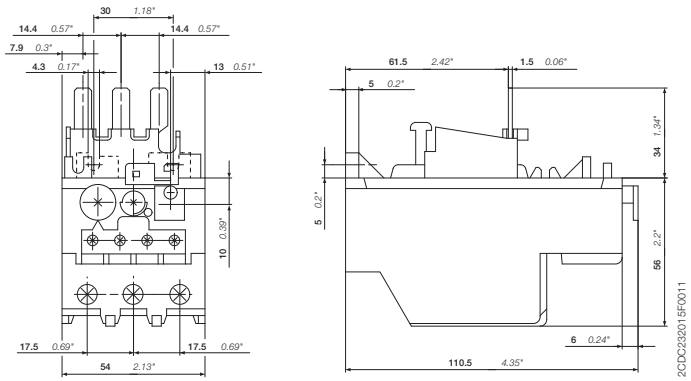
Ordering details

Setting range A	Short-circuit protective device	Trip class	Type	Order code		Weight (1 pce) kg
18 ... 25	63 A, Fuse type gG / 50 A aM	10A	TA42DU-25	1SAZ311201R1001		0.335
22 ... 32	80 A, Fuse type gG / 63 A aM	10A	TA42DU-32	1SAZ311201R1002		0.335
29 ... 42	100 A, Fuse type gG / 80 A aM	10A	TA42DU-42	1SAZ311201R1003		0.335

Ordering details accessories

For thermal overload relays	Description	Type	Order code		Weight (1 pce) kg
TA42DU	Single mounting kit	DB80	1SAZ301110R0001		0.155

Main dimensions mm, *inches*



TA42DU

TA42DU thermal overload relays
Technical data

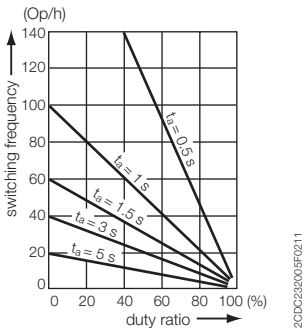
Main circuit – Utilization characteristics according to IEC/EN

Type		TA42DU
Standards		IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1
Rated operational voltage U_e		690 V AC
Rated frequency		DC, 50/60 Hz
Trip class		10A
Number of poles		3
Duty time		100 %
Operating frequency without early tripping		Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty"
Rated impulse withstand voltage U_{imp}		6 kV
Rated insulation voltage U_i		690 V AC

Auxiliary circuit according to IEC/EN

Type		TA42DU
Rated operational voltage U_e		500 V AC, 440 V DC
Conventional free air thermal current I_{th}	N.C., 95-96	10 A
	N.O., 97-98	6 A
Rated frequency		DC, 50/60 Hz
Number of poles		1 N.O. + 1 N.C.
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category		
110-120 V	N.C., 95-96	3.00 A
	N.O., 97-98	3.00 A
220-230-240 V	N.C., 95-96	3.00 A
	N.O., 97-98	3.00 A
440 V	N.C., 95-96	1.90 A
	N.O., 97-98	1.00 A
480-500 V	N.C., 95-96	1.00 A
	N.O., 97-98	1.00 A
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category		
24 V	N.C., 95-96	1.25 A
	N.O., 97-98	1.25 A
60 V	N.C., 95-96	0.25 A
	N.O., 97-98	0.25 A
110-120-125 V	N.C., 95-96	0.25 A
	N.O., 97-98	0.25 A
250 V	N.C., 95-96	0.12 A
	N.O., 97-98	0.04 A
Minimum switching capacity		17 V / 3 mA
Short-circuit protective device	N.C., 95-96	10 A, Fuse type gG
	N.O., 97-98	6 A, Fuse type gG
Rated impulse withstand voltage U_{imp}		6 kV
Rated insulation voltage U_i		690 V

Technical diagram – Intermittent periodic duty



t_a: Motor starting time

2CDC106040C0201

TA42DU thermal overload relays
Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type	TA42DU
Standards	UL 508, CSA 22.2 No. 14
Maximum operational voltage	600 V AC
Trip rating	125 % of FLA
Full load amps (FLA)	See table "Full load amps and short-circuit protective device"
Short-circuit rating RMS symmetrical	See table "Full load amps and short-circuit protective device"
Short-circuit protective device	See table "Full load amps and short-circuit protective device"

Auxiliary circuit according to UL/CSA

Type		TA42DU
Contact rating	N.C., 95-96	C600
	N.O., 97-98	B600
Conventional thermal current		5 A

Full load amps and short-circuit protective device

Type	Full load amps (FLA)	Short-circuit protective device						
		480 / 600 V AC						
		Short circuit rating RMS symmetrical	Fuse type	Listed circuit breaker	Short circuit rating RMS symmetrical	Listed circuit breaker	Short circuit rating RMS symmetrical	Fuse type
TA42DU-25	25 A	5 kA	80 A, K5/ RK5	80 A	35 / 18 kA	80 A	50 kA	100 A, Class J
TA42DU-32	32 A	5 kA	100 A, K5/ RK5	80 A	35 / 18 kA	80 A	50 kA	100 A, Class J
TA42DU-42	42 A	5 kA	150 A, K5/ RK5	80 A	35 / 18 kA	80 A	50 kA	200 A, Class J

2CDC106040C0201

TA42DU thermal overload relays
Technical data

General technical data

Type			TA42DU
Pollution degree			3
Phase loss sensitive			Yes
Ambient air temperature			
Operation	Open - compensated without derating		-25 ... +55 °C
	Open		-25 ... +55 °C
Storage			-40 ... +70 °C
Ambient air temperature compensation			Continuous
Maximum operating altitude permissible			2000 m
Resistance to shock acc. to IEC 60068-2-27			12 g / 15 ms
Mounting position			Position 1-6
Mounting			Mount on the contactor and tighten the screws of the main circuit terminals or with single mounting kit on DIN rail (35 mm)
Degree of protection			IP20

Electrical connection

6

Main circuit

Type			TA42DU
Connecting capacity			
	Rigid	**1 x** **2 x**	2.5 ... 25 mm² 2.5 ... 16 mm²
	Flexible with insulated ferrule	**1 x** **2 x**	2.5 ... 25 mm² 2.5 ... 10 mm²
	Stranded acc. to UL/CSA	**1 x or 2 x**	AWG 8-1
	Flexible acc. to UL/CSA	**1 x or 2 x**	AWG 8-1
Stripping length			14 mm
Tightening torques			4.5 Nm / 40 lb.in
Connection screw			M6 (Pozidriv 2)

Auxiliary circuit

Type			TA42DU
Connecting capacity			
	Rigid	**1 x or 2 x**	0.75 ... 4 mm²
	Flexible with ferrule	**1 x or 2 x**	0.75 ... 2.5 mm²
	Flexible with insulated ferrule	**1 x or 2 x**	0.75 ... 2.5 mm²
	Flexible	**1 x or 2 x**	0.75 ... 2.5 mm²
	Stranded acc. to UL/CSA	**1 x or 2 x**	AWG 18-14
	Flexible acc. to UL/CSA	**1 x or 2 x**	AWG 18-14
Stripping length			9 mm
Tightening torques			0.8 ... 1.3 Nm / 12 lb.in
Connection screw			M3.5 (Pozidriv 2)

2CDC106040C0201

TA75DU thermal overload relays
18 … 80 A

TA75DU-63

Description

The TA75DU thermal overload relays are economic electromechanical protection devices for the main circuit. They offer reliable protection for motors in the event of overload or phase failure. The devices have trip class 10A.

The thermal overload relays are three pole relays with bimetal tripping elements. The motor current flows through the bimetal tripping elements and heats them directly and indirectly. In case of an overload (over current), the bimetal elements bent as a result of the heating. This leads to a release of the relay and a change of the contacts switching position (95-96 / 97-98).

– Manual or automatic reset selectable
– Phase loss sensitive acc. to IEC/EN 60947-4-1
– Two electrically isolated auxiliary contacts – 1 N.O. + 1 N.C.
– TEST and STOP function – Trip indication on the front
– Temperature compensation
– Suitable for three- and single-phase applications

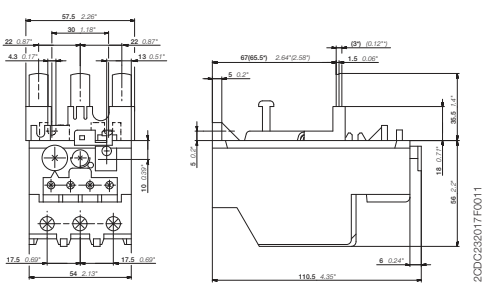
Ordering details

Setting range A	Short-circuit protective device	Trip class	Type	Order code		Weight (1 pce) kg
18 ... 25	63 A, Fuse type gG / 50 A aM	10A	TA75DU-25	1SAZ321201R1001		0.335
22 ... 32	80 A, Fuse type gG / 63 A aM	10A	TA75DU-32	1SAZ321201R1002		0.335
29 ... 42	100 A, Fuse type gG / 80 A aM	10A	TA75DU-42	1SAZ321201R1003		0.335
36 ... 52	125 A, Fuse type gG / 100 A aM	10A	TA75DU-52	1SAZ321201R1004		0.335
45 ... 63	160 A, Fuse type gG / 125 A aM	10A	TA75DU-63	1SAZ321201R1005		0.335
60 ... 80	200 A, Fuse type gG / 160 A aM	10A	TA75DU-80	1SAZ321201R1006		0.370

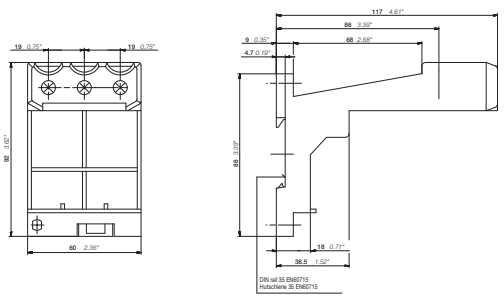
Ordering details accessories

For thermal overload relays	Description	Type	Order code		Weight (1 pce) kg
TA75DU	Single mounting kit	DB80	1SAZ301110R0001		0.155

Main dimensions mm, *inches*



TA75DU



DB80

TA75DU thermal overload relays
Technical data

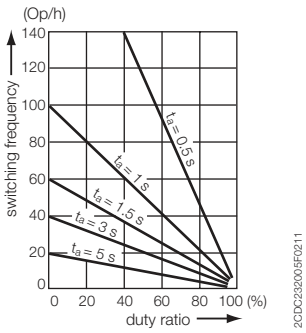
Main circuit – Utilization characteristics according to IEC/EN

Type	TA75DU
Standards	IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1
Rated operational voltage U_e	690 V AC
Rated frequency	DC, 50/60 Hz
Trip class	10A
Number of poles	3
Duty time	100 %
Operating frequency without early tripping	Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty"
Rated impulse withstand voltage U_{imp}	6 kV
Rated insulation voltage U_i	690 V AC

Auxiliary circuit according to IEC/EN

Type		TA75DU
Rated operational voltage U_e		500 V AC, 440 V DC
Conventional free air thermal current I_{th}	N.C., 95-96	10 A
	N.O., 97-98	6 A
Rated frequency		DC, 50/60 Hz
Number of poles		1 N.O. + 1 N.C.
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category		
110-120 V	N.C., 95-96	3.00 A
	N.O., 97-98	3.00 A
220-230-240 V	N.C., 95-96	3.00 A
	N.O., 97-98	3.00 A
440 V	N.C., 95-96	1.90 A
	N.O., 97-98	1.00 A
480-500 V	N.C., 95-96	1.00 A
	N.O., 97-98	1.00 A
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category		
24 V	N.C., 95-96	1.25 A
	N.O., 97-98	1.25 A
60 V	N.C., 95-96	0.25 A
	N.O., 97-98	0.25 A
110-120-125 V	N.C., 95-96	0.25 A
	N.O., 97-98	0.25 A
250 V	N.C., 95-96	0.12 A
	N.O., 97-98	0.04 A
Minimum switching capacity		17 V / 3 mA
Short-circuit protective device	N.C., 95-96	10 A, Fuse type gG
	N.O., 97-98	6 A, Fuse type gG
Rated impulse withstand voltage U_{imp}		6 kV
Rated insulation voltage U_i		690 V

Technical diagram – Intermittent periodic duty



t_a: Motor starting time

2CDC106043C0201

TA75DU thermal overload relays
Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type		TA75DU
Standards		UL 508, CSA 22.2 No. 14
Maximum operational voltage		600 V AC
Trip rating		125 % of FLA
Full load amps (FLA)		See table "Full load amps and short-circuit protective device"
Short-circuit rating RMS symmetrical		See table "Full load amps and short-circuit protective device"
Short-circuit protective device		See table "Full load amps and short-circuit protective device"

Auxiliary circuit according to UL/CSA

Type		TA75DU
Contact rating	N.C., 95-96	C600
	N.O., 97-98	B600
Conventional thermal current		5 A

Full load amps and short-circuit protective device

Type	Full load amps (FLA)	Short-circuit protective device 480 / 600 V AC		
		Short circuit rating RMS symmetrical	Fuse type	Listed circuit breaker
TA75DU-25	25 A	5 kA	80 A, K5 / RK5	80 A
TA75DU-32	32 A	5 kA	100 A, K5 / RK5	80 A
TA75DU-42	42 A	5 kA	150 A, K5 / RK5	80 A
TA75DU-52	52 A	5 kA	175 A, K5 / RK5	125 A
TA75DU-63	63 A	10 kA	200 A, K5 / RK5	125 A
TA75DU-80	80 A	10 kA	250 A, K5 / RK5	125 A

2CDC106043C0201

TA75DU thermal overload relays
Technical data

General technical data

Type			TA75DU
Pollution degree			3
Phase loss sensitive			Yes
Ambient air temperature			
Operation	Open - compensated without derating		-25 ... +55 °C
	Open		-25 ... +55 °C
Storage			-40 ... +70 °C
Ambient air temperature compensation			Continuous
Maximum operating altitude permissible			2000 m
Resistance to shock acc. to IEC 60068-2-27			12 g / 15 ms
Mounting position			Position 1-6
Mounting			Mount on the contactor and tighten the screws of the main circuit terminals or with single mounting kit on DIN rail (35 mm)
Degree of protection			IP20

Electrical connection

6

Main circuit

Type			TA75DU
Connecting capacity			
	Rigid	**1 x** **2 x**	2.5 ... 25 mm² 2.5 ... 16 mm²
	Flexible with insulated ferrule	**1 x** **2 x**	2.5 ... 25 mm² 2.5 ... 10 mm²
	Stranded acc. to UL/CSA	**1 x or 2 x**	AWG 8-1
	Flexible acc. to UL/CSA	**1 x or 2 x**	AWG 8-1
Stripping length			14 mm
Tightening torques			4.5 Nm / 40 lb.in
Connection screw			M6 (Pozidriv 2)

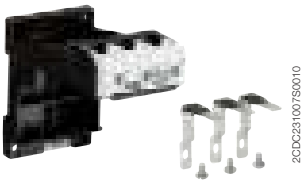
Auxiliary circuit

Type			TA75DU
Connecting capacity			
	Rigid	**1 x or 2 x**	0.75 ... 4 mm²
	Flexible with ferrule	**1 x or 2 x**	0.75 ... 2.5 mm²
	Flexible with insulated ferrule	**1 x or 2 x**	0.75 ... 2.5 mm²
	Flexible	**1 x or 2 x**	0.75 ... 2.5 mm²
	Stranded acc. to UL/CSA	**1 x or 2 x**	AWG 18-14
	Flexible acc. to UL/CSA	**1 x or 2 x**	AWG 18-14
Stripping length			9 mm
Tightening torques			0.8 ... 1.3 Nm / 12 lb.in
Connection screw			M3.5 (Pozidriv 2)

2CDC106043C0201

TA80DU thermal overload relays
29 … 80 A

TA80DU-80



DB80

Description

The TA80DU thermal overload relays are economic electromechanical protection devices for the main circuit. They offer reliable protection for motors in the event of overload or phase failure. The devices have trip class 10A.

The thermal overload relays are three pole relays with bimetal tripping elements. The motor current flows through the bimetal tripping elements and heats them directly and indirectly. In case of an overload (over current), the bimetal elements bent as a result of the heating. This leads to a release of the relay and a change of the contacts switching position (95-96 / 97-98).

– Manual or automatic reset selectable
– Phase loss sensitive acc. to IEC/EN 60947-4-1
– Two electrically isolated auxiliary contacts – 1 N.O. + 1 N.C.
– TEST and STOP function – Trip indication on the front
– Temperature compensation
– Suitable for three- and single-phase applications

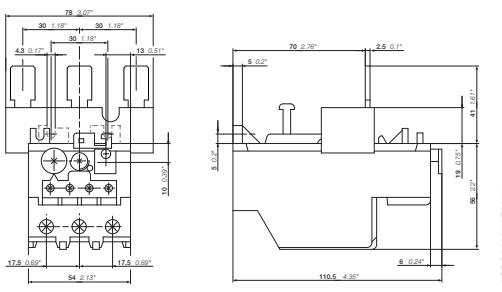
Ordering details

Setting range A	Short-circuit protective device	Trip class	Type	Order code		Weight (1 pce) kg
29 ... 42	100 A, Fuse type gG / 80 A aM	10A	TA80DU-42	1SAZ331201R1003		0.360
36 ... 52	125 A, Fuse type gG / 100 A aM	10A	TA80DU-52	1SAZ331201R1004		0.365
45 ... 63	160 A, Fuse type gG / 125 A aM	10A	TA80DU-63	1SAZ331201R1005		0.365
60 ... 80	200 A, Fuse type gG / 160 A aM	10A	TA80DU-80	1SAZ331201R1006		0.375

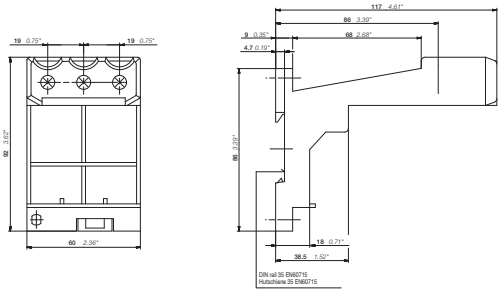
Ordering details accessories

For thermal overload relay	Description	Type	Order code		Weight (1 pce) kg
TA80DU	Single mounting kit	DB80	1SAZ301110R0001		0.155

Main dimensions mm, *inches*



TA80DU



DB80

TA80DU thermal overload relays
Technical data

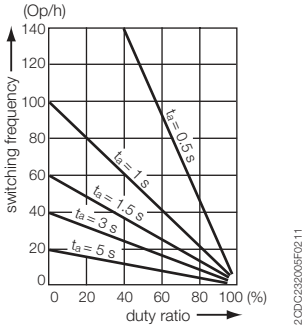
Main circuit – Utilization characteristics according to IEC/EN

Type		TA80DU
Standards		IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1
Rated operational voltage U_e		690 V AC
Rated frequency		DC, 50/60 Hz
Frequency range		0 ... 400 Hz
Trip class		10A
Number of poles		3
Duty time		100 %
Operating frequency without early tripping		Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty"
Rated impulse withstand voltage U_{imp}		6 kV
Rated insulation voltage U_i		690 V AC

Auxiliary circuit according to IEC/EN

Type		TA80DU
Rated operational voltage U_e		500 V AC, 440 V DC
Conventional free air thermal current I_{th}	**N.C., 95-96**	10 A
	N.O., 97-98	6 A
Rated frequency		DC, 50/60 Hz
Number of poles		1 N.O. + 1 N.C.
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category		
110-120 V	**N.C., 95-96**	3.00 A
	N.O., 97-98	3.00 A
220-230-240 V	**N.C., 95-96**	3.00 A
	N.O., 97-98	3.00 A
440 V	**N.C., 95-96**	1.90 A
	N.O., 97-98	1.00 A
480-500 V	**N.C., 95-96**	1.00 A
	N.O., 97-98	1.00 A
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category		
24 V	**N.C., 95-96**	1.25 A
	N.O., 97-98	1.25 A
60 V	**N.C., 95-96**	0.25 A
	N.O., 97-98	0.25 A
110-120-125 V	**N.C., 95-96**	0.25 A
	N.O., 97-98	0.25 A
250 V	**N.C., 95-96**	0.12 A
	N.O., 97-98	0.04 A
Minimum switching capacity		17 V / 3 mA
Short-circuit protective device	**N.C., 95-96**	10 A, Fuse type gG
	N.O., 97-98	6 A, Fuse type gG
Rated impulse withstand voltage U_{imp}		6 kV
Rated insulation voltage U_i		690 V

Technical diagram – Intermittent periodic duty



t_a: Motor starting time

2CDC106044C0201

TA80DU thermal overload relays
Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type	TA80DU
Standards	UL 508, CSA 22.2 No. 14
Maximum operational voltage	600 V AC
Trip rating	125 % of FLA
Full load amps (FLA)	See table "Full load amps and short-circuit protective device"
Short-circuit rating RMS symmetrical	See table "Full load amps and short-circuit protective device"
Short-circuit protective device	See table "Full load amps and short-circuit protective device"

Auxiliary circuit according to UL/CSA

Type		TA80DU
Contact rating	N.C., 95-96	C600
	N.O., 97-98	B600
Conventional thermal current		5 A

Full load amps and short-circuit protective device

Type	Full load amps (FLA)	Short-circuit protective device 480 / 600 V AC		
		Short circuit rating RMS symmetrical	Fuse type	Listed circuit breaker
TA80DU-42	42 A	5 kA	150 A, K5 / RK5	80 A
TA80DU-52	52 A	5 kA	175 A, K5 / RK5	125 A
TA80DU-63	63 A	10 kA	200 A, K5 / RK5	125 A
TA80DU-80	80 A	10 kA	250 A, K5 / RK5	125 A

2CDC106044C0201

TA80DU thermal overload relays
Technical data

General technical data

Type			**TA80DU**
Pollution degree			3
Phase loss sensitive			Yes
Ambient air temperature			
Operation	Open - compensated without derating		-25 ... +55 °C
	Open		-25 ... +55 °C
Storage			-40 ... +70 °C
Ambient air temperature compensation			Continuous
Maximum operating altitude permissible			2000 m
Resistance to shock acc. to IEC 60068-2-27			12 g / 15 ms
Mounting position			Position 1-6
Mounting			Mount on the contactor and tighten the screws of the main circuit terminals or with single mounting kit on DIN rail (35 mm)
Degree of protection			IP20

Electrical connection

6

Main circuit

Type			**TA80DU**
Connecting capacity			
	Rigid	**1 x** **2 x**	2.5 ... 25 mm² 2.5 ... 16 mm²
	Flexible with insulated ferrule	**1 x** **2 x**	2.5 ... 25 mm² 2.5 ... 10 mm²
	Stranded acc. to UL/CSA	**1 x or 2 x**	AWG 8-1
	Flexible acc. to UL/CSA	**1 x or 2 x**	AWG 8-1
Stripping length			14 mm
Tightening torques			4.5 Nm / 40 lb.in
Connection screw			M6 (Pozidriv 2)

Auxiliary circuit

Type			**TA80DU**
Connecting capacity			
	Rigid	**1 x or 2 x**	0.75 ... 4 mm²
	Flexible with ferrule	**1 x or 2 x**	0.75 ... 2.5 mm²
	Flexible with insulated ferrule	**1 x or 2 x**	0.75 ... 2.5 mm²
	Flexible	**1 x or 2 x**	0.75 ... 2.5 mm²
	Stranded acc. to UL/CSA	**1 x or 2 x**	AWG 18-14
	Flexible acc. to UL/CSA	**1 x or 2 x**	AWG 18-14
Stripping length			9 mm
Tightening torques			0.8 ... 1.3 Nm / 12 lb.in
Connection screw			M3.5 (Pozidriv 2)

2CDC106044C0201

TA110DU thermal overload relays
66 ... 110 A

TA110DU-110

Description

The TA110DU thermal overload relays are economic electromechanical protection devices for the main circuit. They offer reliable protection for motors in the event of overload or phase failure. The devices have trip class 10A.

The thermal overload relays are three pole relays with bimetal tripping elements. The motor current flows through the bimetal tripping elements and heats them directly and indirectly. In case of an overload (over current), the bimetal elements bent as a result of the heating. This leads to a release of the relay and a change of the contacts switching position (95-96 / 97-98).

- Manual or automatic reset selectable
- Phase loss sensitive acc. to IEC/EN 60947-4-1
- Two electrically isolated auxiliary contacts – 1 N.O. + 1 N.C.
- TEST and STOP function – Trip indication on the front
- Temperature compensation
- Suitable for three- and single-phase applications

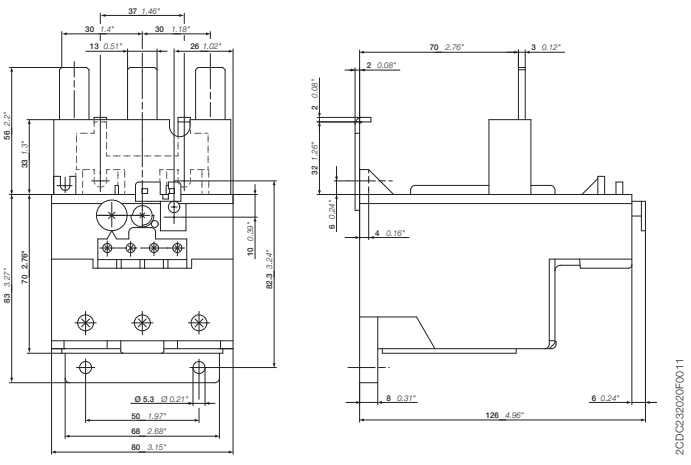
Ordering details

Setting range A	Short-circuit protective device	Trip class	Type	Order code		Weight (1 pce) kg
66 ... 90	200 A, Fuse type gG / 160 A aM	10A	TA110DU-90	1SAZ411201R1001		0.750
80 ... 110	224 A, Fuse type gG / 200 A aM	10A	TA110DU-110	1SAZ411201R1002		0.755

Ordering details accessories

For thermal overload relays	Description	Type	Order code		Weight (1 pce) kg
TA110DU	Single mounting kit	DB200	1SAZ401110R0001		0.225

Main dimensions mm, *inches*



TA110DU

TA110DU thermal overload relays
Technical data

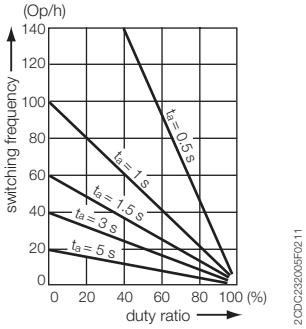
Main circuit – Utilization characteristics according to IEC/EN

Type		TA110DU
Standards		IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1
Rated operational voltage U_e		690 V AC
Rated frequency		DC, 50/60 Hz
Frequency range		0 ... 400 Hz
Trip class		10A
Number of poles		3
Duty time		100 %
Operating frequency without early tripping		Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty"
Rated impulse withstand voltage U_{imp}		6 kV
Rated insulation voltage U_i		690 V AC

Auxiliary circuit according to IEC/EN

Type		TA110DU
Rated operational voltage U_e		500 V AC, 440 V DC
Conventional free air thermal current I_{th}	**N.C., 95-96**	10 A
	N.O., 97-98	6 A
Rated frequency		DC, 50/60 Hz
Number of poles		1 N.O. + 1 N.C.
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category		
110-120 V	**N.C., 95-96**	3.00 A
	N.O., 97-98	3.00 A
220-230-240 V	**N.C., 95-96**	3.00 A
	N.O., 97-98	3.00 A
440 V	**N.C., 95-96**	1.90 A
	N.O., 97-98	1.00 A
480-500 V	**N.C., 95-96**	1.00 A
	N.O., 97-98	1.00 A
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category		
24 V	**N.C., 95-96**	1.25 A
	N.O., 97-98	1.25 A
60 V	**N.C., 95-96**	0.25 A
	N.O., 97-98	0.25 A
110-120-125 V	**N.C., 95-96**	0.25 A
	N.O., 97-98	0.25 A
250 V	**N.C., 95-96**	0.12 A
	N.O., 97-98	0.04 A
Minimum switching capacity		17 V / 3 mA
Short-circuit protective device	**N.C., 95-96**	10 A, Fuse type gG
	N.O., 97-98	6 A, Fuse type gG
Rated impulse withstand voltage U_{imp}		6 kV
Rated insulation voltage U_i		690 V

Technical diagram – Intermittent periodic duty



t_a: Motor starting time

2CDC106037C0201

TA110DU thermal overload relays
Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type	TA110DU
Standards	UL 508, CSA 22.2 No. 14
Maximum operational voltage	600 V AC
Trip rating	125 % of FLA
Full load amps (FLA)	See table "Full load amps and short-circuit protective device"
Short-circuit rating RMS symmetrical	See table "Full load amps and short-circuit protective device"
Short-circuit protective device	See table "Full load amps and short-circuit protective device"

Auxiliary circuit according to UL/CSA

Type		TA110DU
Contact rating	N.C., 95-96	C600
	N.O., 97-98	B600
Conventional thermal current		5 A

Full load amps and short-circuit protective device

Type	Full load amps (FLA)	Short-circuit protective device						
		480 / 600 V AC						
		Short circuit rating RMS symmetrical	Fuse type	Listed circuit breaker	Short circuit rating RMS symmetrical	Fuse type	Short circuit rating RMS symmetrical	Listed circuit breaker
TA110DU-90	90 A	10 kA	250 A, K5 / RK5	150 A	65 kA	200 A, Class J	65 / 25 kA	150 A
TA110DU-110	110 A	10 kA	250 A, K5 / RK5	250 A	65 kA	200 A, Class J	65 / 25 kA	150 A

2CDC106037C0201

TA110DU thermal overload relays
Technical data

General technical data

Type			TA110DU
Pollution degree			3
Phase loss sensitive			Yes
Ambient air temperature			
Operation	Open - compensated without derating		-25 ... +55 °C
	Open		-25 ... +55 °C
Storage			-40 ... +70 °C
Ambient air temperature compensation			Continuous
Maximum operating altitude permissible			2000 m
Resistance to shock acc. to IEC 60068-2-27			12 g / 15 ms
Mounting position			Position 1-6
Mounting			Mount on the contactor and tighten the screws of the main circuit terminals or with single mounting kit
Degree of protection			IP20

Electrical connection

6

Main circuit

Type			TA110DU
Connecting capacity			
	Rigid	**1 x** **2 x**	16 ... 35 mm² -
	Flexible	**1 x** **2 x**	16 ... 35 mm² -
	Stranded acc. to UL/CSA	**1 x or 2 x**	AWG 6-2/0
	Flexible acc. to UL/CSA	**1 x or 2 x**	AWG 6-2/0
Stripping length			25 mm
Tightening torques			7.2 ... 9.6 Nm / 40 lb.in
Connection screw			M8 (Hexagon)

Auxiliary circuit

Type			TA110DU
Connecting capacity			
	Rigid	**1 x or 2 x**	0.75 ... 4 mm²
	Flexible with ferrule	**1 x or 2 x**	0.75 ... 2.5 mm²
	Flexible with insulated ferrule	**1 x or 2 x**	0.75 ... 2.5 mm²
	Flexible	**1 x or 2 x**	0.75 ... 2.5 mm²
	Stranded acc. to UL/CSA	**1 x or 2 x**	AWG 18-14
	Flexible acc. to UL/CSA	**1 x or 2 x**	AWG 18-14
Stripping length			9 mm
Tightening torques			0.8 ... 1.3 Nm / 12 lb.in
Connection screw			M3.5 (Pozidriv 2)

2CDC106037C0201

TA200DU thermal overload relays
66 … 200 A

TA200DU-200

Description

The TA200DU thermal overload relays are economic electromechanical protection devices for the main circuit. They offer reliable protection for motors in the event of overload or phase failure. The devices have trip class 10A.

The thermal overload relays are three pole relays with bimetal tripping elements. The motor current flows through the bimetal tripping elements and heats them directly and indirectly. In case of an overload (over current), the bimetal elements bent as a result of the heating. This leads to a release of the relay and a change of the contacts switching position (95-96 / 97-98).

– Manual or automatic reset selectable
– Phase loss sensitive acc. to IEC/EN 60947-4-1
– Two electrically isolated auxiliary contacts – 1 N.O. + 1 N.C.
– TEST and STOP function – Trip indication on the front
– Temperature compensation
– Suitable for three- and single-phase applications

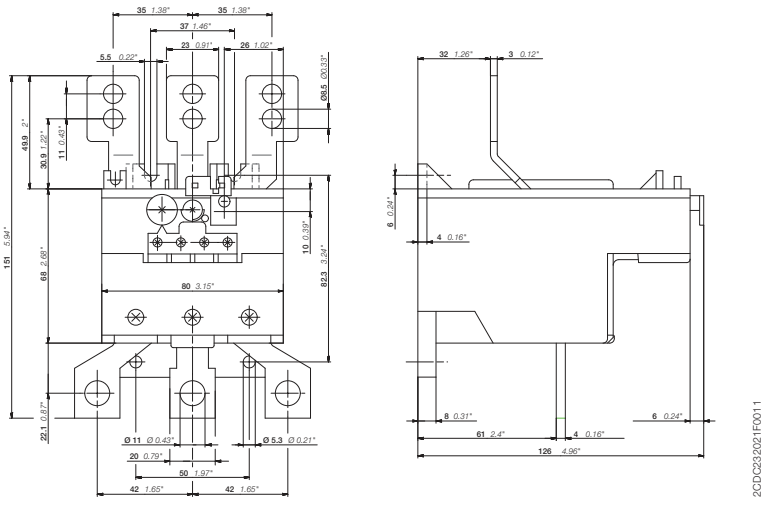
Ordering details

Setting range A	Short-circuit protective device	Trip class	Type	Order code		Weight (1 pce) kg
66 ... 90	200 A, Fuse type gG / 160 A aM	10A	TA200DU-90	1SAZ421201R1001		0.755
80 ... 110	224 A, Fuse type gG / 200 A aM	10A	TA200DU-110	1SAZ421201R1002		0.760
100 ... 135	224 A, Fuse type gG / 200 A aM	10A	TA200DU-135	1SAZ421201R1003		0.760
110 ... 150	250 A, Fuse type gG / 224 A aM	10A	TA200DU-150	1SAZ421201R1004		0.760
130 ... 175	315 A, Fuse type gG / 250 A aM	10A	TA200DU-175	1SAZ421201R1005		0.770
150 ... 200	315 A, Fuse type gG / 250 A aM	10A	TA200DU-200	1SAZ421201R1006		0.785

Ordering details accessories

For thermal overload relays	Description	Type	Order code		Weight (1 pce) kg
TA200DU	Terminal shroud	LT200/A	1SAZ401901R1001		0.090
TA200DU	Single mounting kit	DB200	1SAZ401110R0001		0.225

Main dimensions mm, *inches*



TA200DU

TA200DU thermal overload relays
Technical data

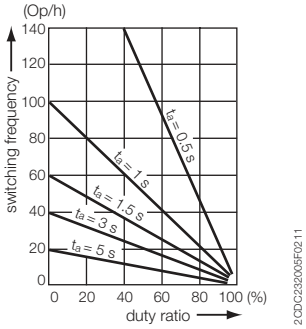
Main circuit – Utilization characteristics according to IEC/EN

Type		TA200DU
Standards		IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1
Rated operational voltage U_e		690 V AC
Rated frequency		DC, 50/60 Hz
Frequency range		0 ... 400 Hz
Trip class		10A
Number of poles		3
Duty time		100 %
Operating frequency without early tripping		Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty"
Rated impulse withstand voltage U_{imp}		6 kV
Rated insulation voltage U_i		690 V AC

Auxiliary circuit according to IEC/EN

Type		TA200DU
Rated operational voltage U_e		500 V AC, 440 V DC
Conventional free air thermal current I_{th}	**N.C., 95-96**	10 A
	N.O., 97-98	6 A
Rated frequency		DC, 50/60 Hz
Number of poles		1 N.O. + 1 N.C.
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category		
110-120 V	**N.C., 95-96**	3.00 A
	N.O., 97-98	3.00 A
220-230-240 V	**N.C., 95-96**	3.00 A
	N.O., 97-98	3.00 A
440 V	**N.C., 95-96**	1.90 A
	N.O., 97-98	1.00 A
480-500 V	**N.C., 95-96**	1.00 A
	N.O., 97-98	1.00 A
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category		
24 V	**N.C., 95-96**	1.25 A
	N.O., 97-98	1.25 A
60 V	**N.C., 95-96**	0.25 A
	N.O., 97-98	0.25 A
110-120-125 V	**N.C., 95-96**	0.25 A
	N.O., 97-98	0.25 A
250 V	**N.C., 95-96**	0.12 A
	N.O., 97-98	0.04 A
Minimum switching capacity		17 V / 3 mA
Short-circuit protective device	**N.C., 95-96**	10 A, Fuse type gG
	N.O., 97-98	6 A, Fuse type gG
Rated impulse withstand voltage U_{imp}		6 kV
Rated insulation voltage U_i		690 V

Technical diagram – Intermittent periodic duty



t_a: Motor starting time

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TA200DU thermal overload relays
Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type		TA200DU
Standards		UL 508, CSA 22.2 No. 14
Maximum operational voltage		600 V AC
Trip rating		125 % of FLA
Full load amps (FLA)		See table "Full load amps and short-circuit protective device"
Short-circuit rating RMS symmetrical		See table "Full load amps and short-circuit protective device"
Short-circuit protective device		See table "Full load amps and short-circuit protective device"

Auxiliary circuit according to UL/CSA

Type		TA200DU
Contact rating	N.C., 95-96	C600
	N.O., 97-98	B600
Conventional thermal current		5 A

Full load amps and short-circuit protective device

Type	Full load amps (FLA)	Short-circuit protective device						
		480 / 600 V AC						
		Short circuit rating RMS symmetrical	Fuse type	Listed circuit breaker	Short circuit rating RMS symmetrical	Fuse type	Short circuit rating RMS symmetrical	Listed circuit breaker
TA200DU-90	90 A	10 kA	250 A, K5 / RK5	225 A	-	-	-	-
TA200DU-110	110 A	10 kA	250 A, K5 / RK5	225 A	-	-	18 kA	125 A
TA200DU-135	135 A	10 kA	300 A, K5 / RK5	225 A	50 kA	400 A, Class J	35 / 18 kA	225 A
TA200DU-150	150 A	10 kA	300 A, K5 / RK5	225 A	65 kA	400 A, Class J	35 / 18 kA	225 A
TA200DU-175	175 A	10 kA	300 A, K5 / RK5	225 A	65 kA	400 A, Class J	35 / 18 kA	225 A
TA200DU-200	200 A	10 kA	400 A, K5 / RK5	400 A	65 kA	400 A, Class J	35 / 18 kA	225 A

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TA200DU thermal overload relays
Technical data

General technical data

Type			TA200DU
Pollution degree			3
Phase loss sensitive			Yes
Ambient air temperature			
Operation	Open - compensated without derating		-25 ... +55 °C
	Open		-25 ... +55 °C
Storage			-40 ... +70 °C
Ambient air temperature compensation			Continuous
Maximum operating altitude permissible			2000 m
Resistance to shock acc. to IEC 60068-2-27			12 g / 15 ms
Mounting position			Position 1-6
Mounting			Mount on the contactor and tighten the screws of the main circuit terminals or with single mounting kit
Degree of protection			IP20

Electrical connection

6

Main circuit

Type			TA200DU
Connecting capacity			
	Rigid	**1 x**	25 ... 120 mm²
	Flexible	**1 x**	16 ... 35 mm²
	Lugs		L ≤ 12 mm / l > 6 mm
Tightening torques			4 Nm
Connection screw			M6

Auxiliary circuit

Type			TA200DU
Connecting capacity			
	Rigid	**1 x or 2 x**	0.75 ... 4 mm²
	Flexible with ferrule	**1 x or 2 x**	0.75 ... 2.5 mm²
	Flexible with insulated ferrule	**1 x or 2 x**	0.75 ... 2.5 mm²
	Flexible	**1 x or 2 x**	0.75 ... 2.5 mm²
	Stranded acc. to UL/CSA	**1 x or 2 x**	AWG 18-14
	Flexible acc. to UL/CSA	**1 x or 2 x**	AWG 18-14
Stripping length			9 mm
Tightening torques			0.8 ... 1.3 Nm / 12 lb.in
Connection screw			M3.5 (Pozidriv 2)

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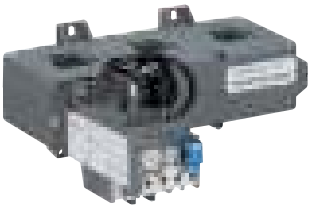
TA450DU thermal overload relays
130 ... 310 A



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TA450DU-310

Description

The TA450DU thermal overload relays are economic electromechanical protection devices for the main circuit. They offer reliable protection for motors in the event of overload or phase failure. The devices have trip class 10A.

The thermal overload relays are three pole relays with bimetal tripping elements. The motor current flows through the bimetal tripping elements and heats them directly and indirectly. In case of an overload (over current), the bimetal elements bent as a result of the heating. This leads to a release of the relay and a change of the contacts switching position (95-96 / 97-98).

- Manual or automatic reset selectable
- Phase loss sensitive acc. to IEC/EN 60947-4-1
- Two electrically isolated auxiliary contacts – 1 N.O. + 1 N.C.
- TEST and STOP function – Trip indication on the front
- Temperature compensation
- Suitable for three- and single-phase applications

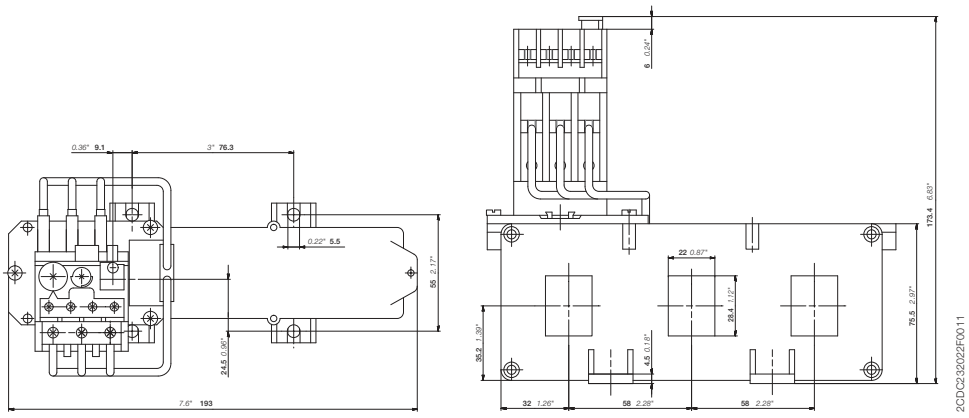
Ordering details

Setting range A	Short-circuit protective device	Trip class	Type	Order code		Weight (1 pce) kg
130 ... 185	not applicable	10A	TA450DU-185	1SAZ511201R1001		1.500
165 ... 235	not applicable	10A	TA450DU-235	1SAZ511201R1002		1.500
220 ... 310	not applicable	10A	TA450DU-310	1SAZ511201R1003		1.500

Ordering details accessories

For thermal overload relays	Description	Type	Order code		Weight (1 pce) kg
TA450DU	Terminal shroud	DT450/A185	1SAZ501901R1001		1.070
TA450DU	Terminal shroud	DT450/A300	1SAZ501902R1001		1.180

Main dimensions mm, *inches*



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TA450DU

2CDC106041C0201

TA450DU thermal overload relays
Technical data

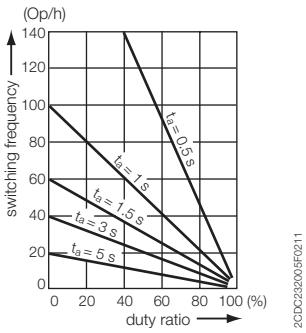
Main circuit – Utilization characteristics according to IEC/EN

Type		TA450DU
Standards		IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1
Rated operational voltage U_e		1000 V AC
Rated frequency		50/60 Hz
Trip class		10A
Number of poles		3
Duty time		100 %
Operating frequency without early tripping		Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty"
Rated impulse withstand voltage U_{imp}		8 kV
Rated insulation voltage U_i		1000 V AC

Auxiliary circuit according to IEC/EN

Type		TA450DU
Rated operational voltage U_e		500 V AC, 440 V DC
Conventional free air thermal current I_{th}	N.C., 95-96	10 A
	N.O., 97-98	6 A
Rated frequency		DC, 50/60 Hz
Number of poles		1 N.O. + 1 N.C.
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category		
110-120 V	N.C., 95-96	3.00 A
	N.O., 97-98	3.00 A
220-230-240 V	N.C., 95-96	3.00 A
	N.O., 97-98	3.00 A
440 V	N.C., 95-96	1.90 A
	N.O., 97-98	1.00 A
480-500 V	N.C., 95-96	1.00 A
	N.O., 97-98	1.00 A
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category		
24 V	N.C., 95-96	1.25 A
	N.O., 97-98	1.25 A
60 V	N.C., 95-96	0.25 A
	N.O., 97-98	0.25 A
110-120-125 V	N.C., 95-96	0.25 A
	N.O., 97-98	0.25 A
250 V	N.C., 95-96	0.12 A
	N.O., 97-98	0.04 A
Minimum switching capacity		17 V / 3 mA
Short-circuit protective device	N.C., 95-96	10 A, Fuse type gG
	N.O., 97-98	6 A, Fuse type gG
Rated impulse withstand voltage U_{imp}		6 kV
Rated insulation voltage U_i		500 V

Technical diagram – Intermittent periodic duty



t_a: Motor starting time

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TA450DU thermal overload relays
Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type	TA450DU
Standards	UL 508, CSA 22.2 No. 14
Maximum operational voltage	600 V AC
Trip rating	125 % of FLA
Full load amps (FLA)	See table "Full load amps and short-circuit protective device"
Short-circuit rating RMS symmetrical	See table "Full load amps and short-circuit protective device"
Short-circuit protective device	See table "Full load amps and short-circuit protective device"

Auxiliary circuit according to UL/CSA

Type		TA450DU
Contact rating	N.C., 95-96	C600
	N.O., 97-98	B600
Conventional thermal current		5 A

Full load amps and short-circuit protective device

Type	Full load amps (FLA)	Short-circuit protective device 480 / 600 V AC		
		Short circuit rating RMS symmetrical	Fuse type	Listed circuit breaker
TA450DU-185	185 A	10 kA	na	na
TA450DU-235	235 A	10 kA	na	na
TA450DU-310	310 A	18 kA	na	na

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TA450DU thermal overload relays
Technical data

General technical data

Type			TA450DU
Pollution degree			3
Phase loss sensitive			Yes
Ambient air temperature			
	Operation	Open - compensated without derating	-25 ... +55 °C
		Open	-25 ... +55 °C
	Storage		-40 ... +70 °C
Ambient air temperature compensation			Continuous
Maximum operating altitude permissible			2000 m
Resistance to shock acc. to IEC 60068-2-27			12 g / 15 ms
Mounting position			Position 1-6
Degree of protection			IP20

Electrical connection

Main circuit

Type		TA450DU
Connecting capacity		
	Bar	Max. 21 x 28.4 mm

Auxiliary circuit

Type			TA450DU
Connecting capacity			
	Rigid	**1 x or 2 x**	0.75 ... 4 mm²
	Flexible with ferrule	**1 x or 2 x**	0.75 ... 2.5 mm²
	Flexible with insulated ferrule	**1 x or 2 x**	0.75 ... 2.5 mm²
	Flexible	**1 x or 2 x**	0.75 ... 2.5 mm²
	Stranded acc. to UL/CSA	**1 x or 2 x**	AWG 18-14
	Flexible acc. to UL/CSA	**1 x or 2 x**	AWG 18-14
Stripping length			9 mm
Tightening torques			0.8 ... 1.3 Nm / 12 lb.in
Connection screw			M3.5 (Pozidriv 2)

2CDC106041C0201

E16DU, E45DU, E80DU, E140DU electronic overload relays
0.10 to 140 A

2CDC231001F0007

E16DU-1.0

2CDC231002F0006

E45DU-30

2CDC231003F0006

E80DU-80

2CDC231004F0006

E140DU-140

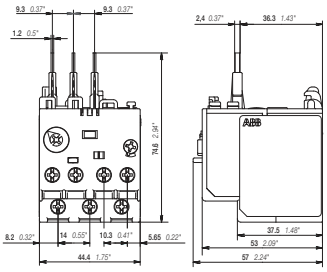
Description

The E16DU up to E140DU are self-supplied electronic overload relays, which means no extra external supply is needed. It offers reliable protection for motors in the event of overload or phase failure. Easy to use like a thermal overload relay and compatible with standard motor applications, the electronic overload relay is convincing, above all, due to its wide setting range, high accuracy, high operational temperature range and the possibility to select a trip class (10E, 20E, 30E). Further features are the temperature compensation, trip contact (N.C.), signal contact (N.O.), automatic or manual reset selectable, trip-free mechanism, STOP and TEST function and a trip indication. The overload relays are connected directly to the contactors. Single mounting kits are available as accessory.

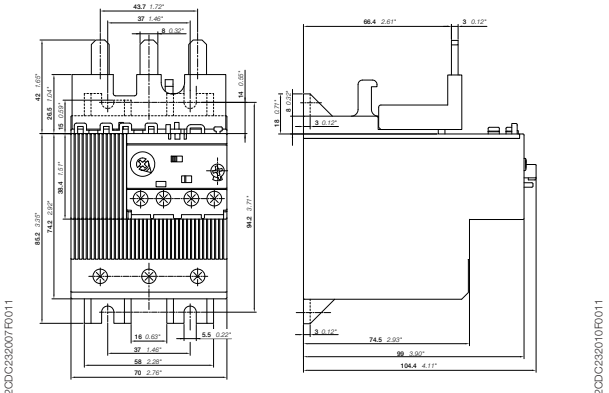
Ordering details

Setting range A	Short-circuit protective device	Trip class	Type	Order code		Weight (1 pce) kg
E16DU electronic overload relays						
0.10 ... 0.32	1 A, Fuse type gG	10E, 20E, 30E	E16DU-0.32	1SAX111001R1101		0.150
0.30 ... 1.00	4 A, Fuse type gG	10E, 20E, 30E	E16DU-1.0	1SAX111001R1102		0.150
0.80 ... 2.70	10 A, Fuse type gG	10E, 20E, 30E	E16DU-2.7	1SAX111001R1103		0.150
1.90 ... 6.30	20 A, Fuse type gG	10E, 20E, 30E	E16DU-6.3	1SAX111001R1104		0.150
5.70 ... 18.9	50 A, Fuse type gG	10E, 20E, 30E	E16DU-18.9	1SAX111001R1105		0.150
E45DU electronic overload relays						
9.00 ... 30.0	160 A, Fuse type gG	10E, 20E, 30E	E45DU-30	1SAX211001R1101		0.350
15.0 ... 45.0	160 A, Fuse type gG	10E, 20E, 30E	E45DU-45	1SAX211001R1102		0.350
E80DU electronic overload relay						
27.0 ... 80.0 A	250 A	10E, 20E, 30E	E80DU-80	1SAX311001R1101		0.770
E140DU electronic overload relay						
50.0 ... 140.0 A	400 A	10E, 20E, 30E	E140DU-140	1SAX321001R1101		0.915

Main dimensions mm, *inches*



E16DU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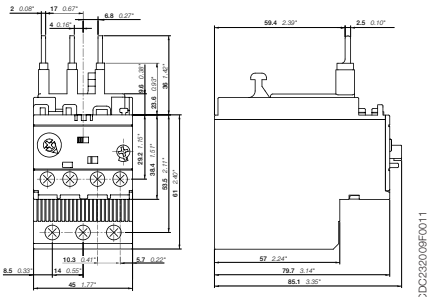
E80DU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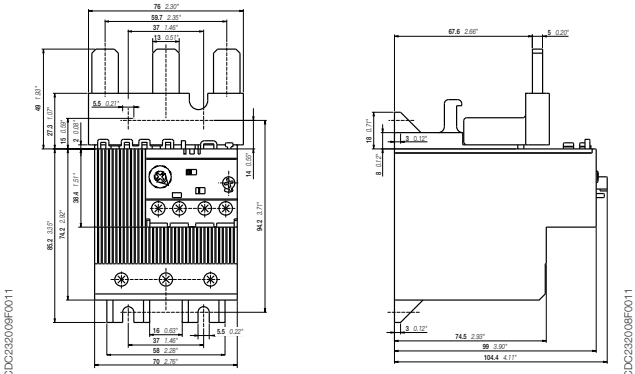
E45DU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E140DU

2CDC107030C0201

E16DU, E45DU, E80DU, E140DU electronic overload relays
Technical data

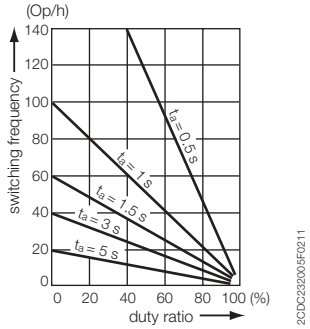
Main circuit – Utilization characteristics according to IEC/EN

Type	E16DU	E45DU	E80DU	E140DU
Standards	IEC 60947-1 / 60947-4-1 / 60947-5-1 and EN 60947-1 / 60947-4-1 / 60947-5-1			
Rated operational voltage U_e	690 V AC		1000 V AC	
Rated frequency	50/60 Hz			
Trip class	10E, 20E, 30E, selectable			
Number of poles	3			
Duty time	100 %			
Operating frequency without early tripping	Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty"			
Rated impulse withstand voltage U_{imp}	6 kV			
Rated insulation voltage U_i	690 V AC		1000 V AC	

Auxiliary circuit according to IEC/EN

Type		E16DU	E45DU	E80DU	E140DU
Rated operational voltage U_e		600 V AC / DC			
Conventional free air thermal current I_{th}		6 A			
Rated frequency		DC, 50/60 Hz			
Number of poles		1 N.C. + 1 N.O.			
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category					
110-120 V	**50/60 Hz**	3.00 A			
220-230-240 V	**50/60 Hz**	3.00 A			
440 V	**50/60 Hz**	1.10 A			
480-500 V	**50/60 Hz**	0.72 A			
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category					
24 V		1.50 A			
60 V		0.55 A			
110-120-125 V		0.55 A			
250 V		0.27 A			
Minimum switching capacity		12 V / 3 mA			
Short-circuit protective device		6 A, Fuse type gG			
Rated impulse withstand voltage U_{imp}		6 kV			
Rated insulation voltage U_i		690 V			

Technical diagram – Intermittent periodic duty



t_a: Motor starting time

2CDC107030C0201

E16DU, E45DU, E80DU, E140DU electronic overload relays
Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type	E16DU	E45DU	E80DU	E140DU
Standards	UL 508, CSA 22.2, No. 14			
Maximum operational voltage	600 V AC			
Trip rating	125 % of FLA			
Full load amps (FLA)	See table "Full load amps and short-circuit protective device"			
Short-circuit rating RMS symmetrical	See table "Full load amps and short-circuit protective device"			
Short-circuit protective device	See table "Full load amps and short-circuit protective device"			

Auxiliary circuit according to UL/CSA

Type	E16DU	E45DU	E80DU	E140DU
Contact rating	B600,Q300			
Conventional thermal current	5 A			

Full load amps and short-circuit protective device

Type	Full load amps (FLA)	Short-circuit protective device					
		480 V AC		600 V AC			
		SCCR	Fuse type	SCCR	Fuse type	SCCR	Fuse type
E16DU-0.32	0.32 A	50 kA	2 A, Class J	5 kA	2 A, K5 / RK5	100 kA	2 A, Class J
E16DU-1.0	1.00 A	50 kA	2 A, K5 / RK5	5 kA	2 A, K5 / RK5	100 kA	2 A, Class J
E16DU-2.7	2.70 A	50 kA	4 A, K5 / RK5	5 kA	4 A, K5 / RK5	100 kA	4 A, Class J
E16DU-6.3	6.30 A	50 kA	15 A, K5 / RK5	5 kA	15 A, K5 / RK5	100 kA	15 A, Class J
E16DU-18.9	18.90 A	50 kA	30 A, K5 / RK5	5 kA	30 A, K5 / RK5	100 kA	30 A, Class J

Type	Full load amps (FLA)	Short-circuit protective device			
		600 V AC			
		SCCR	Fuse type	SCCR	Fuse type
E45DU-30	30 A	18 kA	150 A, K5 / RK5	100 kA	150 A, Class J
E45DU-45	45 A	18 kA	200 A, K5 / RK5	100 kA	200 A, Class J

Type	Full load amps (FLA)	Short-circuit protective device	
		600 V AC	
		SCCR	Fuse type
E80DU-80	80 A	18 kA	300 A, K5 / RK5

Type	Full load amps (FLA)	Short-circuit protective device	
		600 V AC	
		SCCR	Fuse type
E140DU-140	140 A	18 kA	400 A, K5 / RK5

2CDC107030C0201

E16DU, E45DU, E80DU, E140DU electronic overload relays
Technical data

General data

Type			E16DU	E45DU	E80DU	E140DU
Pollution degree			3			
Phase loss sensitive			Yes			
Ambient air temperature						
	Operation	Open - compensated without derating	-25 ... +70 °C			
	Storage		-50 ... +85 °C			
Ambient air temperature compensation			Continuous			
Maximum operating altitude permissible			2000 m			
Resistance to shock acc. to IEC 60068-2-27			15 g / 11 ms			
Resistance to vibrations acc. to IEC 60068-2-6			5 g / 3 ... 150 Hz			
Mounting position			Position 1-6			
Mounting			Mount on the contactor and tighten the screws of the main circuit terminals or with single mounting kit			
Degree of protection			IP20			

6

Electrical connection

Main circuit

Type			E16DU	E45DU	E80DU	E140DU
Connecting capacity						
	Rigid	**1 x**	1 ... 4 mm²	2.5 ... 16 mm²	6 ... 95 mm²	6 ... 95 mm²
		2 x	1 ... 4 mm²	2.5 ... 16 mm²	6 ... 35 mm²	6 ... 35 mm²
	Flexible with insulated ferrule	**1 x**	0.75 ... 2.5 mm²	2.5 ... 10 mm²	6 ... 70 mm²	6 ... 70 mm²
		2 x	0.75 ... 2.5 mm²	2.5 ... 10 mm²	6 ... 35 mm²	6 ... 35 mm²
	Stranded acc. to UL/CSA	**1 x**	AWG 16-10	AWG 14-6	AWG 10-0	AWG 8-0
		2 x	AWG 16-10	AWG 14-6	-	-
	Flexible acc. to UL/CSA	**1 x**	AWG 16-10	AWG 14-6	AWG 10-0	AWG 8-0
		2 x	AWG 16-10	AWG 14-6	-	-
Stripping length			9 mm	13 mm	-	-
Tightening torques			0.8 - 1.5 Nm / 7 lb.in	2.3 - 2.6 Nm / 22 lb.in	6 - 6.5 Nm / 53 lb.in	6 - 6.5 Nm / 53 lb.in
Connection screw			M3.5 (Pozidriv 2)	M5 (Pozidriv 2)	M8 (inbus 4)	M8 (inbus 4)

Auxiliary circuit

Type			E16DU	E45DU	E80DU	E140DU
Connecting capacity						
	Rigid	**1 or 2 x**	1 ... 4 mm²			
	Flexible with ferrule	**1 or 2 x**	0.75 ... 2.5 mm²			
	Flexible with insulated ferrule	**1 or 2 x**	0.75 ... 2.5 mm²			
	Flexible	**1 or 2 x**	0.75 ... 2.5 mm²			
	Stranded acc. to UL/CSA	**1 or 2 x**	AWG 16-10			
	Flexible acc. to UL/CSA	**1 or 2 x**	AWG 16-10			
Stripping length			9 mm			
Tightening torques			0.8 ... 1.2 Nm / 7 lb.in			
Connection screw			M3.5 (Pozidriv 2)			

2CDC107030C0201

E16DU, E45DU, E80DU, E140DU electronic overload relays
Accessories

2CDC231003F0010

DB16E

2CDC231004F0010

DB45E

2CDC231005F0010

DB80E

2CDC231006F0010

DB140E

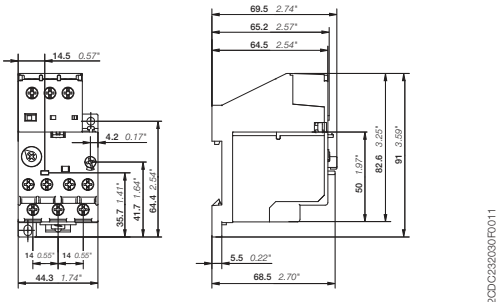
Description

Single mounting kits are available as accessory for E16DU, E45DU, E80DU, and E140DU. The single mounting kits offer the possibility to mount the overload relay separately from the contactor.

Ordering details

For electronic overload relays	Description	Type	Order code		Weight (1 pce) kg
Single mounting kits					
E16DU	Single mounting kit	DB16E	1SAX101110R0001		0.035
E45DU	Single mounting kit	DB45E	1SAX201110R1001		0.090
E80DU	Single mounting kit	DB80E	1SAX301110R1001		0.145
E140DU	Single mounting kit	DB140E	1SAX301110R1002		0.145

Main dimensions mm, *inches*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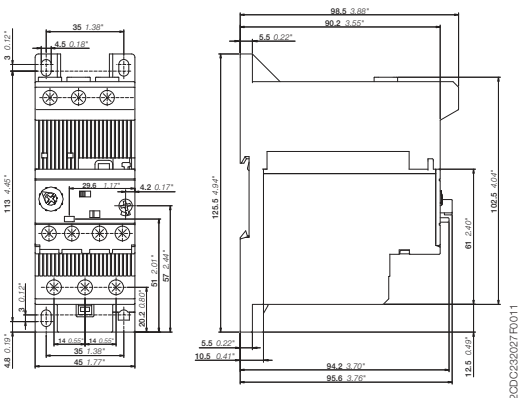
DB16E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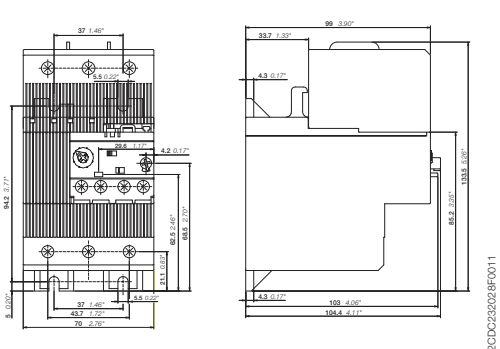
DB45E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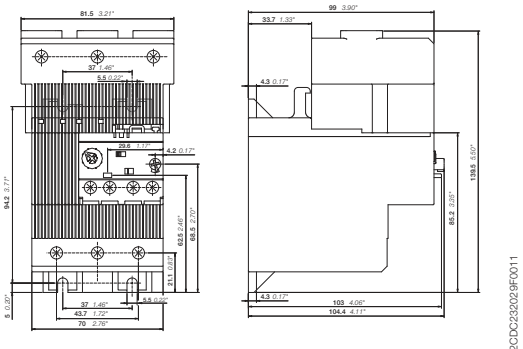
DB80E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DB140E

EF19, EF45 electronic overload relays
0.10 to 45.0 A

EF19-18.9

EF45-30

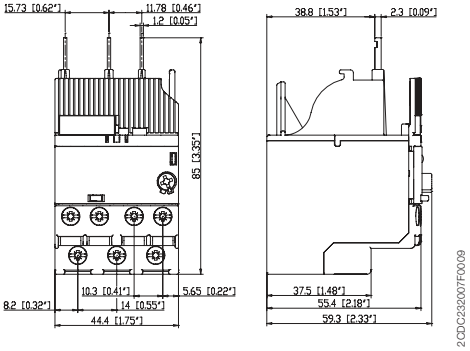
Description

The EF19 and EF45 are self-supplied electronic overload relays, which means no extra external supply is needed. It offers reliable protection for motors in the event of overload or phase failure. Easy to use like a thermal overload relay and compatible with standard motor applications, the electronic overload relay is convincing, above all, due to its wide setting range, high accuracy, high operational temperature range and the possibility to select a trip class (10E, 20E, 30E). Further features are the temperature compensation, trip contact (N.C.), signal contact (N.O.), automatic or manual reset selectable, trip-free mechanism, STOP and TEST function and a trip indication. The overload relays are connected directly to the contactors.

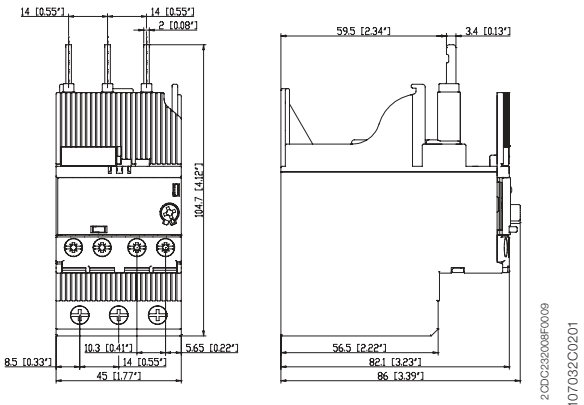
Ordering details

Setting range A	Short-circuit protective device	Trip class	Type	Order code		Weight (1 pce) kg
EF19 electronic overload relays						
0.10 ... 0.32	1 A, Fuse type gG	10E, 20E, 30E	EF19-0.32	1SAX121001R1101		0.158
0.30 ... 1.00	4 A, Fuse type gG	10E, 20E, 30E	EF19-1.0	1SAX121001R1102		0.158
0.80 ... 2.70	10 A, Fuse type gG	10E, 20E, 30E	EF19-2.7	1SAX121001R1103		0.158
1.90 ... 6.30	20 A, Fuse type gG	10E, 20E, 30E	EF19-6.3	1SAX121001R1104		0.158
5.70 ... 18.9	50 A, Fuse type gG	10E, 20E, 30E	EF19-18.9	1SAX121001R1105		0.158
EF45 electronic overload relays						
9.00 ... 30.0	160 A, Fuse type gG	10E, 20E, 30E	EF45-30	1SAX221001R1101		0.362
15.0 ... 45.0	160 A, Fuse type gG	10E, 20E, 30E	EF45-45	1SAX221001R1102		0.362

Main dimensions mm, *inches*



EF19



EF45

2CDC107032C0201

EF19, EF45 electronic overload relays
Technical data

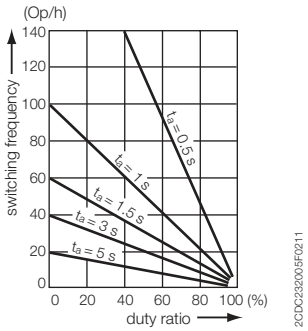
Main circuit – Utilization characteristics according to IEC/EN

Type	EF19	EF45
Standards	IEC 60947-1 / 60947-4-1 / 60947-5-1 and EN 60947-1 / 60947-4-1 / 60947-5-1	
Rated operational voltage U_e	690 V AC	
Rated frequency	50/60 Hz	
Trip class	10E, 20E, 30E, selectable	
Number of poles	3	
Duty time	100 %	
Operating frequency without early tripping	Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty"	
Rated impulse withstand voltage U_{imp}	6 kV	
Rated insulation voltage U_i	690 V AC	

Auxiliary circuit according to IEC/EN

Type		EF19	EF45
Rated operational voltage U_e		600 V AC / DC	
Conventional free air thermal current I_{th}		6 A	
Rated frequency		DC, 50/60 Hz	
Number of poles		1 N.C. + 1 N.O.	
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category			
110-120 V	**50/60 Hz**	3.00 A	
220-230-240 V	**50/60 Hz**	3.00 A	
440 V	**50/60 Hz**	1.10 A	
480-500 V	**50/60 Hz**	0.75 A	
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category			
24 V		1.50 A	
60 V		0.55 A	
110-120-125 V		0.55 A	
250 V		0.27 A	
Minimum switching capacity		12 V / 3 mA	
Short-circuit protective device		6 A, Fuse type gG	
Rated impulse withstand voltage U_{imp}		6 kV	
Rated insulation voltage U_i		690 V	

Technical diagram – Intermittent periodic duty



t_a: Motor starting time

2CDC107032C0201

EF19, EF45 electronic overload relays
Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type	EF19	EF45
Standards	UL 508, CSA 22.2 No. 14	
Maximum operational voltage	600 V AC	
Trip rating	125 % of FLA	
Full load amps (FLA)	See table "Full load amps and short-circuit protective device"	
Short-circuit rating RMS symmetrical	See table "Full load amps and short-circuit protective device"	
Short-circuit protective device	See table "Full load amps and short-circuit protective device"	

Auxiliary circuit according to UL/CSA

Type		EF19	EF45
Contact rating	N.C., 95-96	B600, Q600	
	N.O., 97-98	B600, Q600	
Conventional thermal current		5 A	

Full load amps and short-circuit protective device

Type	Full load amps (FLA)	Short-circuit protective device					
		480 V AC		600 V AC			
		SCCR	Fuse type	SCCR	Fuse type	SCCR	Fuse type
EF19-0.32	0.32 A	50 kA	2 A, Class J	5 kA	2 A, K5 / RK5	100 kA	2 A, Class J
EF19-1.0	1.00 A	50 kA	2 A, K5 / RK5	5 kA	2 A, K5 / RK5	100 kA	2 A, Class J
EF19-2.7	2.70 A	50 kA	4 A, K5 / RK5	5 kA	4 A, K5 / RK5	100 kA	4 A, Class J
EF19-6.3	6.30 A	50 kA	15 A, K5 / RK5	5 kA	15 A, K5 / RK5	100 kA	15 A, Class J
EF19-18.9	18.90 A	50 kA	30 A, K5 / RK5	5 kA	30 A, K5 / RK5	100 kA	30 A, Class J

Type	Full load amps (FLA)	Short-circuit protective device					
		480 V AC		600 V AC			
		SCCR	Fuse type	SCCR	Fuse type	SCCR	Fuse type
EF45-30	30 kA	18 kA	150 A, K5 / RK5	18 kA	150 A, K5 / RK5	100 kA	150 A, Class J
EF45-45	45 kA	18 kA	200 A, K5 / RK5	18 kA	200 A, K5 / RK5	100 kA	200 A, Class J

2CDC107032C0201

EF19, EF45 electronic overload relays
Technical data

General data

Type			EF19	EF45
Pollution degree			3	
Phase loss sensitive			Yes	
Ambient air temperature				
	Operation	Open - compensated without derating	-25 ... +70 °C	
	Storage		-50 ... +85 °C	
Ambient air temperature compensation			Continuous	
Maximum operating altitude permissible			2000 m	
Resistance to shock acc. to IEC 60068-2-27			15 g / 11 ms	
Resistance to vibrations acc. to IEC 60068-2-6			1 g / 3 ... 150 Hz	
Mounting position			Position 1-6	
Mounting			Mount on the contactor and tighten the screws of the main circuit terminals	
Degree of protection			IP20	

Electrical connection

Main circuit

Type			EF19	EF45
Connecting capacity				
	Rigid	**1 or 2 x**	1 ... 4 mm²	2.5 ... 16 mm²
	Flexible with insulated ferrule	**1 or 2 x**	0.75 ... 2.5 mm²	2.5 ... 10 mm²
	Stranded acc. to UL/CSA	**1 or 2 x**	AWG 16-10	AWG 14-6
	Flexible acc. to UL/CSA	**1 or 2 x**	AWG 16-10	AWG 14-6
Stripping length			9 mm	13 mm
Tightening torques			0.8 ... 1.5 Nm / 7 ... 13 lb.in	2.3 ... 2.6 Nm / 20 ... 22 lb.in
Connection screw			M3.5 (Pozidriv 2)	

Auxiliary circuit

Type			EF19	EF45
Connecting capacity				
	Rigid	**1 or 2 x**	1 ... 4 mm²	
	Flexible with ferrule	**1 or 2 x**	0.75 ... 2.5 mm²	
	Flexible with insulated ferrule	**1 or 2 x**	0.75 ... 2.5 mm²	
	Flexible	**1 or 2 x**	0.75 ... 2.5 mm²	
	Stranded acc. to UL/CSA	**1 or 2 x**	AWG 18-10	
	Flexible acc. to UL/CSA	**1 or 2 x**	AWG 18-10	
Stripping length			9 mm	
Tightening torques			0.8 ... 1.2 Nm / 7 ... 11 lb.in	
Connection screw			M3 (Pozidriv 2)	

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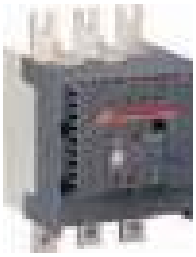
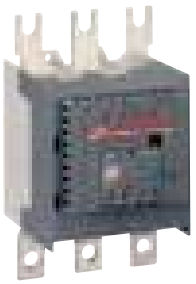
E200DU, E320DU electronic overload relays
60 to 320 A


2CDC231001F0008

E200DU-200


2CDC231002F0008

E320DU-320

Description

The E200DU and E320DU are self-supplied electronic overload relays, which means no extra external supply is needed. It offers reliable protection for motors in the event of overload or phase failure. Easy to use like a thermal overload relay and compatible with standard motor applications, the electronic overload relay is convincing, above all, due to its wide setting range, high accuracy, high operational temperature range and the possibility to select a trip class (10E, 20E, 30E). Further features are the temperature compensation, trip contact (N.C.), signal contact (N.O.), automatic or manual reset selectable, trip-free mechanism, STOP and TEST function and a trip indication. The overload relays are connected directly to the contactors.

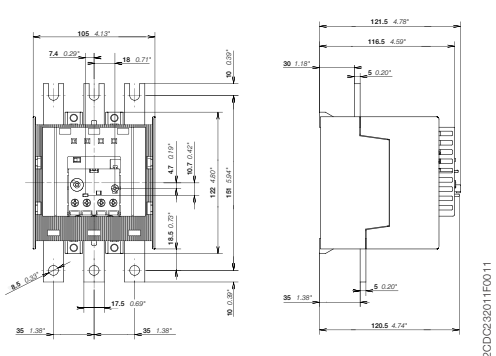
Ordering details

Setting range A	Short-circuit protective device	Trip class	Type	Order code		Weight (1 pce) kg
E200DU electronic overload relay						
60.0 ... 200.0	800 A	10E, 20E, 30E	E200DU-200	1SAX511001R1101		1.210
E320DU electronic overload relay						
100.0 ... 320.0	630 A	10E, 20E, 30E	E320DU-320	1SAX521001R1101		1.430

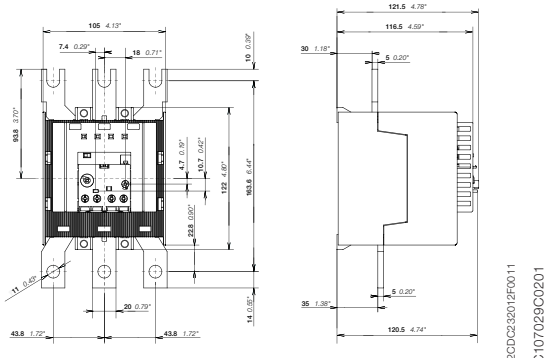
Terminal shrouds for E200DU and E320DU electronic overload relay

For electronic overload relays	Description	Type	Order code		Weight (1 pce) kg
E200DU	LT200E Terminal shroud for E200DU	LT200E	1SAX501904R0001		0.085
E320DU	LT320E Terminal shroud for E320DU	LT320E	1SAX601904R0001		0.105

Main dimensions mm, *inches*



E200DU



E320DU

2CDC232011F0011
2CDC232012F0011
2CDC107029G0201

E200DU, E320DU electronic overload relays
Technical data

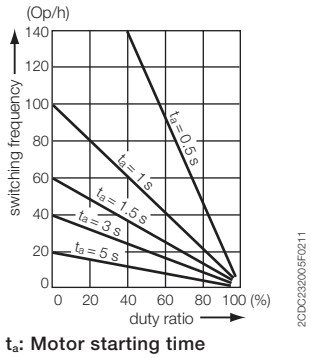
Main circuit – Utilization characteristics according to IEC/EN

Type	E200DU	E320DU
Standards	IEC 60947-1 / 60947-4-1 / 60947-5-1 and EN 60947-1 / 60947-4-1 / 60947-5-1	
Rated operational voltage U_e	1000 V AC	
Rated frequency	50/60 Hz	
Trip class	10E, 20E, 30E, selectable	
Number of poles	3	
Duty time	100 %	
Operating frequency without early tripping	Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty"	
Rated impulse withstand voltage U_{imp}	8 kV	
Rated insulation voltage U_i	1000 V AC	

Auxiliary circuit according to IEC/EN

Type		E16DU	E45DU
Rated operational voltage U_e		600 V AC / DC	
Conventional free air thermal current I_{th}		6 A	
Rated frequency		DC, 50/60 Hz	
Number of poles		1 N.C. + 1 N.O.	
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category			
110-120 V	**50/60 Hz**	3.00 A	
220-230-240 V	**50/60 Hz**	3.00 A	
440 V	**50/60 Hz**	1.10 A	
480-500 V	**50/60 Hz**	0.72 A	
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category			
24 V		1.50 A	
60 V		0.55 A	
110-120-125 V		0.55 A	
250 V		0.27 A	
Minimum switching capacity		12 V / 3 mA	
Short-circuit protective device		6 A, Fuse type gG	
Rated impulse withstand voltage U_{imp}		8 kV	
Rated insulation voltage U_i		690 V	

Technical diagram – Intermittent periodic duty



t_a: Motor starting time

2CDC107029C0201

E200DU, E320DU electronic overload relays
Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type		E200DU	E320DU
Standards		UL 508, CSA 22.2 No. 14	
Maximum operational voltage		600 V AC	
Trip rating		125 % of FLA	

Auxiliary circuit according to UL/CSA

Type		E200DU	E320DU
Contact rating	N.C., 95-96	B600, Q300	
	N.O., 97-98	B600, Q300	
Conventional thermal current		5 A	

General data

Type		E200DU	E320DU
Pollution degree		3	
Phase loss sensitive		Yes	
Ambient air temperature			
Operation	Open - compensated without derating	-25 ... +70 °C	
Storage		-50 ... +85 °C	
Ambient air temperature compensation		Continuous	
Maximum operating altitude permissible		2000 m	
Resistance to shock acc. to IEC 60068-2-27		15 g / 11 ms	
Resistance to vibrations acc. to IEC 60068-2-6		5 g / 3 ... 150 Hz	
Mounting position		Position 1-6	
Mounting		Mount on the contactor and tighten the screws of the main circuit terminals	
Degree of protection		IP20	

Electrical connection

Auxiliary circuit

Type			E200DU	E320DU
Connecting capacity				
	Rigid	1 or 2 x	1 ... 4 mm²	
	Flexible with ferrule	1 or 2 x	0.75 ... 2.5 mm²	
	Flexible with insulated ferrule	1 or 2 x	0.75 ... 2.5 mm²	
	Flexible	1 or 2 x	0.75 ... 2.5 mm²	
	Stranded acc. to UL/CSA	1 or 2 x	AWG 16-10	
	Flexible acc. to UL/CSA	1 or 2 x	AWG 16-10	
Stripping length			9 mm	
Tightening torques			0.8 ... 1.2 Nm / 7 lb.in	
Connection screw			M3.5 (Pozidriv 2)	

2CDC107029C0201

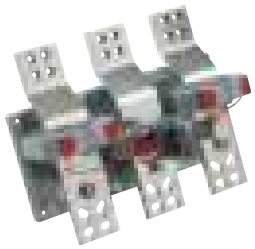
E500DU, E800DU, E1250DU electronic overload relays
150 to 1250 A

2CDC231003F0008

E500DU-500

2CDC231004F0008

E800DU-800



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E1250DU-1250

Description

The E500DU up to E1250DU are self-supplied electronic overload relays, which means no extra external supply is needed. It offers reliable protection for motors in the event of overload or phase failure. Easy to use like a thermal overload relay and compatible with standard motor applications, the electronic overload relay is convincing, above all, due to its wide setting range, high accuracy, high operational temperature range and the possibility to select a trip class (10E, 20E, 30E). Further features are the temperature compensation, trip contact (N.C.), signal contact (N.O.), automatic or manual reset selectable, trip-free mechanism, STOP and TEST function and a trip indication. The overload relays are connected directly to the contactors. Busbar kits are available as accessory for contactor mounting.

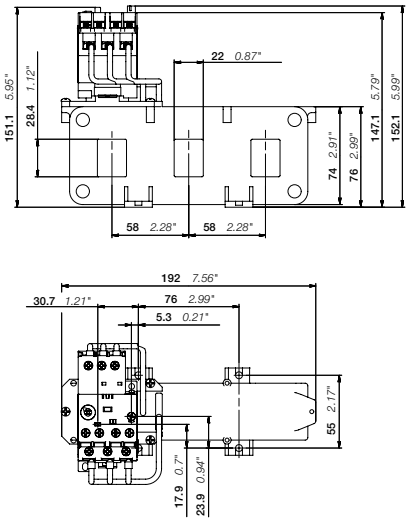
Ordering details

Setting range A	Short-circuit protective device	Trip class	Type	Order code		Weight (1 pce) kg
E500DU electronic overload relay						
150 ... 500	1000 A	10E, 20E, 30E	E500DU-500	1SAX711001R1101		1.170
E800DU electronic overload relay						
250 ... 800	1250 A	10E, 20E, 30E	E800DU-800	1SAX811001R1101		3.905
E1250DU electronic overload relay						
375 ... 1250	-	10E, 20E, 30E	E1250DU-1250	1SFA739001R1000		12.181

Terminal shrouds for E500DU and E800DU electronic overload relay

For electronic overload relays	Description	Type	Order code		Weight (1 pce) kg
E500DU	LT500E Terminal shroud for E500DU	LT500E	1SAX701904R0001		0.360
E800DU	LT800E Terminal shroud for E800DU	LT800E	1SAX801904R0001		0.105

Main dimensions mm, *inches*



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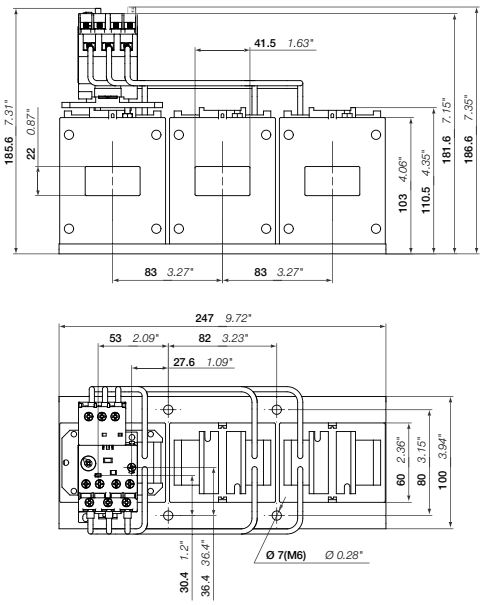
E500DU



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E800DU

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E500DU, E800DU, E1250DU electronic overload relays
Technical data

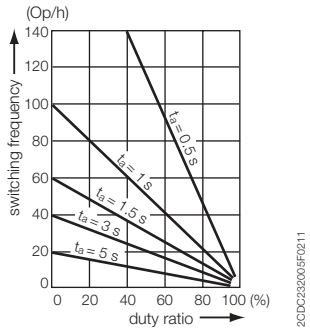
Main circuit – Utilization characteristics according to IEC/EN

Type	E500DU	E800DU	E1250DU
Standards	IEC 60947-1 / 60947-4-1 / 60947-5-1 and EN 60947-1 / 60947-4-1 / 60947-5-1		
Rated operational voltage U_e	1000 V AC		
Rated frequency	50/60 Hz		
Trip class	10E, 20E, 30E, selectable		
Number of poles	3		
Duty time	100 %		
Operating frequency without early tripping	Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty"		
Rated impulse withstand voltage U_{imp}	8 kV		
Rated insulation voltage U_i	1000 V AC		

Auxiliary circuit according to IEC/EN

Type		E500DU	E800DU	E1250DU
Rated operational voltage U_e		600 V AC / DC		
Conventional free air thermal current I_{th}		6 A		
Rated frequency		DC, 50/60 Hz		
Number of poles		1 N.C. + 1 N.O.		
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category				
110-120 V	**50/60 Hz**	3.00 A		
220-230-240 V	**50/60 Hz**	3.00 A		
440 V	**50/60 Hz**	1.10 A		
480-500 V	**50/60 Hz**	0.72 A		
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category				
24 V		1.50 A		
60 V		0.55 A		
110-120-125 V		0.55 A		
250 V		0.27 A		
Minimum switching capacity		12 V / 3 mA		
Short-circuit protective device		6 A, Fuse type gG		
Rated impulse withstand voltage U_{imp}		8 kV		
Rated insulation voltage U_i		690 V		

Technical diagram – Intermittent periodic duty



t_a: Motor starting time

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E500DU, E800DU, E1250DU electronic overload relays
Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type	E500DU	E800DU	E1250DU
Standards	UL 508, CSA 22.2 No. 14		
Maximum operational voltage	600 V AC		
Trip rating	125 % of FLA		

Auxiliary circuit according to UL/CSA

Type		E500DU	E800DU	E1250DU
Contact rating	N.C., 95-96	B600, Q300		
	N.O., 97-98	B600, Q300		
Conventional thermal current		5 A		

General data

Type		E500DU	E800DU	E1250DU
Pollution degree		3		
Phase loss sensitive		Yes		
Ambient air temperature				
Operation	Open - compensated without derating	-25 ... +70 °C		
Storage		-50 ... +85 °C		
Ambient air temperature compensation		Continuous		
Maximum operating altitude permissible		2000 m		
Resistance to shock acc. to IEC 60068-2-27		15 g / 11 ms		
Resistance to vibrations acc. to IEC 60068-2-6		5 g / 3 ... 150 Hz		
Degree of protection		IP20		

Electrical connection

Auxiliary circuit

Type		E500DU	E800DU	E1250DU
Connecting capacity				
Rigid	1 or 2 x	1 ... 4 mm²		
Flexible with ferrule	1 or 2 x	0.75 ... 2.5 mm²		
Flexible with insulated ferrule	1 or 2 x	0.75 ... 2.5 mm²		
Flexible	1 or 2 x	0.75 ... 2.5 mm²		
Stranded acc. to UL/CSA	1 or 2 x	AWG 16-10		
Flexible acc. to UL/CSA	1 or 2 x	AWG 16-10		
Stripping length		9 mm		
Tightening torques		0.8 ... 1.2 Nm / 7 lb.in		
Connection screw		M3.5 (Pozidriv 2)		

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R contactors

Presentation 7/2

Overview

R contactors for the AC circuits switching **7**/4

R contactors for the DC circuits switching **7**/6

Questionnaire 7/8

1SBC101631C0201

R contactors
85 to 5000 A

R contactors with variable number of poles and their variants (contactors with N.C. + N.O. poles, couplers...) are used for controlling power circuits up to 1000 V AC or 1500 V DC. They are designed with common standard components. With the combination of these elements and the adaptation possibilities, special versions can be provided. Designed for long-lasting operation and demanding applications, the ABB R contactors are used for many applications all over the world.

Flexibility of design
- Variable number of poles
- Adjustable number of auxiliary contacts
- Optional combination of N.O. and N.C. poles
- Mechanical or magnetic latching available.

Easy maintenance
- Direct access to all the components of the contactor
- Complete and didactic instruction manual
- Spare parts available
- Dedicated service for bar contactors.

Exceptional durability
- Mechanical durability up to 10 millions operating cycles
- Mechanical switching frequency up to 1200 cycles per hour
- Electrical durability up to 350 000 operating cycles.

Ideal for heavy duty applications
- High making and breaking capacity
- Fully compatible with the requirements of utilization categories AC-3, DC-3 and DC-5 (control of AC / DC motors for mining, iron and steel industries...).

Custom-made solutions
- More than 60 years' experience in dealing with customers projects
- Development of solutions from specifications
- Pre-sales support to identify and define customer requirements
- Specialists available to help you, select your product or optimize your configuration.

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R contactors
For heavy duty applications

R contactors meet the particular requirements of each AC / DC control application up to 5000 A, where the demands are increasing:
- Power distribution
- Photovoltaic, hydroelectric power stations
- Batteries
- Mining
- Railway networks and rolling stock
- Induction furnaces
- Pump stations
- Travelling cranes.

Control your AC applications up to 5000 A
AC-1 Rated operational current up to 5000 A
AC-3 Rated power up to 1500 kW (1520 A - 440 V)

Control your DC applications up to 5000 A
DC-1 Rated operational current up to 5000 A
DC-3 / DC-5 Rated operational current up to 2000 A
1500 V with poles in series

Special applications
AC / DC coupling: LOR.. contactors
Slip ring motor control: FOR.. contactors
AC / DC switching (N.C. / N.O. main poles): NOR & JOR.. contactors
Latching contactors for energy saving and safety requirements: AMA or AME contactors
Field discharge: AM(F)-CC-JORE.. contactors

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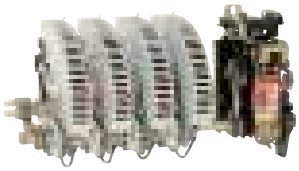
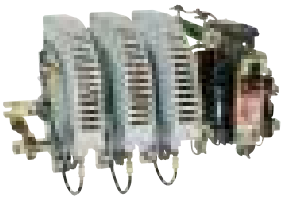
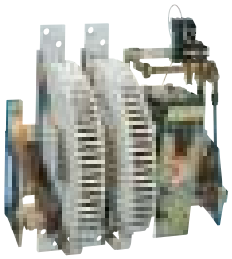
R contactors for the AC circuits switching

Voltage Ue up to **1000 V AC**
Current Ie up to **4500 A**

Contactor type	AC control circuit	~	IORR63..-MT	IORR125..-MT	IORR200..-MT	IORR400..-MT	IORR500..-MT	IORR800..-MT
	DC control circuit	⎓	IORE63..-MT	IORE125..-MT	IORE200..-MT	IORE400..-MT	IORE500..-MT	IORE800..-MT
Categories		**Ue**						
AC-1	at 40 °C		**Ie**	85 A	170 A	260 A	400 A	550 A	800 A
AC-3		690 V AC	**Ie**	85 A	160 A	260 A	400 A	550 A	800 A
		1000 V AC max.	**Ie**	56 A	105 A	180 A	280 A	380 A	580 A
AC-3		690 V AC	**Power**	**80 kW**	**150 kW**	**240 kW**	**400 kW**	**540 kW**	**780 kW**

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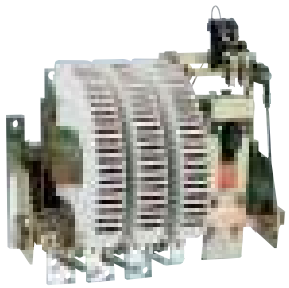

Voltage Ue up to **500 V AC**
Current Ie up to **5000 A**

Contactor type	AC control circuit	~	–	IORR800
	DC control circuit	⎓	–	IORE800
Categories		**Ue**		
AC-1	at 40 °C		**Ie**	From 85 A to 550 A, select above IOR..-MT	900 A
AC-3		380-415-440 V AC	**Ie**	–	800 A
		500 V AC max.	**Ie**	–	800 A
AC-3		400 V AC	**Power**	–	**450 kW**

Recap:
All contactors fulfill the IEC 60947-4-1 / EN 60947-4-1 standards.

Utilization category AC-1: max. breaking current = 1.5 x Ie, max. making current = 1.5 x Ie.

Utilization category AC-3: max. breaking current = 8 x Ie, max. making current = 10 x Ie.

Contactors with NC poles, magnetic or mechanical latching devices on request.

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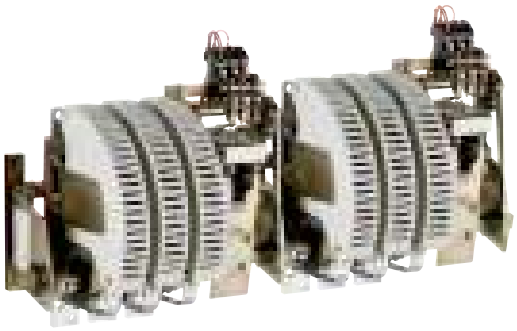

IORR1400..-MT IORE1400..-MT	IORR1700..-MT IORE1700..-MT	IORR2100..-MT IORE2100..-MT	IORR2500..-MT IORE2500..-MT	IORR3200..-MT IORE3200..-MT	IORR3800..-MT IORE3800..-MT	IORR4500..-MT IORE4500..-MT	IORR5100..-MT IORE5100..-MT
1250 A	1650 A	1850 A	2200 A	3000 A	3500 A	4000 A	4500 A
970 A	1170 A	1270 A	–	–	–	–	–
610 A	680 A	810 A	–	–	–	–	–
1000 kW	**1200 kW**	**1300 kW**	–	–	–	–	–

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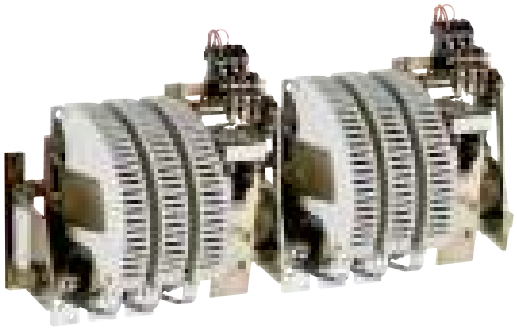

IORR1000 IORE1000	IORR1400 IORE1400	IORR1700 IORE1700	IORR2100 IORE2100	IORR2500 IORE2500	IORR3200 IORE3200	IORR3800 IORE3800	IORR4500 IORE4500	IORR5100 IORE5100
1000 A	1350 A	1650 A	2000 A	2400 A	3200 A	3800 A	4500 A	5000 A
800 A	1060 A	1260 A	1520 A	–	–	–	–	–
800 A	1080 A	1220 A	1340 A	–	–	–	–	–
450 kW	**630 kW**	**750 kW**	**900 kW**	–	–	–	–	–

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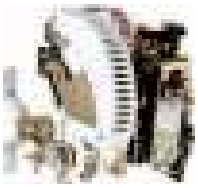
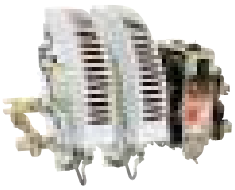
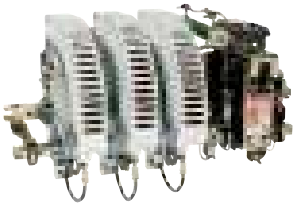
R contactors for the DC circuits switching

Voltage Ue up to **1500 V DC**

Current Ie up to **5000 A**

Contactor type	AC control circuit ~		IORR63..-CC	IORR125..-CC	IORR200..-CC	IORR400..-CC	IORR500..-CC
	DC control circuit ⎓		IORE63..-CC	IORE125..-CC	IORE200..-CC	IORE400..-CC	IORE500..-CC
Number of poles in series*	**Categories**	**Ue max.**					
1 pole	**DC-1**	500 V DC	**Ie**	85 A	170 A	275 A	400 A	550 A
	DC-3 / DC-5	500 V DC	**Ie**	68 A	140 A	205 A	350 A	500 A
2 poles	**DC-1**	1000 V DC	**Ie**	85 A	170 A	275 A	400 A	550 A
	DC-3 / DC-5	1000 V DC	**Ie**	68 A	140 A	205 A	350 A	500 A
3 poles	**DC-1**	1500 V DC	**Ie**	85 A**	170 A**	275 A**	400 A**	550 A**
	DC-3 / DC-5	1500 V DC	**Ie**	68 A**	140 A**	205 A**	350 A**	500 A**

*Number of poles to be fitted in series according to the operational voltage and the utilization categories.

**Version with increased insulation for 1000 V DC < Ue ≤ 1500 V DC, please consult us.

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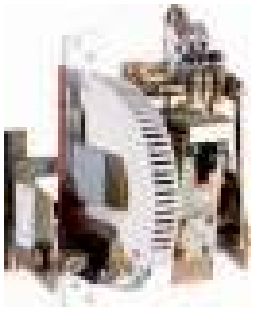
Contactors
UL / CSA approved

Voltage Ue up to **600 V DC**

Current Ie up to **2000 A**



Contactor type	AC control circuit ~		IORR800-10-CC	IORR1000-10-CC	IORR1400-10-CC	IORR1700-10-CC	IORR2100-10-CC
	DC control circuit ⎓		IORE800-10-CC	IORE1000-10-CC	IORE1400-10-CC	IORE1700-10-CC	IORE2100-10-CC
		U max.					
1 pole	**General use**	600 V DC	**Ie**	800 A	1000 A	1300 A	1700 A	2000 A

Recap:
All contactors fulfill the IEC 60947-4-1 / EN 60947-4-1 standards.

Utilization category DC-1: max. breaking current = 1.5 x Ie, max. making current = 1.5 x Ie.

Utilization categories DC-3 / DC-5: max. breaking current = 4 x Ie, max. making current = 4 x Ie.

Contactors with NC poles, magnetic or mechanical latching devices on request.

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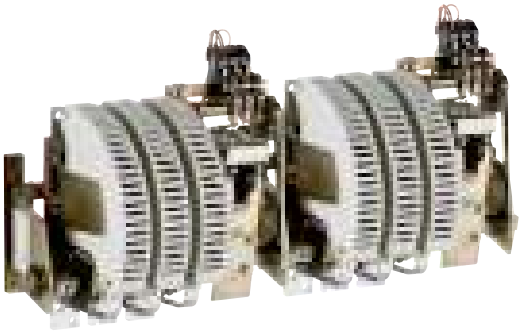


	IORR800..-CC	IORR1000..-CC	IORR1400..-CC	IORR1700..-CC	IORR2100..-CC	IORR2500..-CC	IORR3200..-CC	IORR3800..-CC	IORR4500..-CC	IORR5100..-CC
	IORE800..-CC	IORE1000..-CC	IORE1400..-CC	IORE1700..-CC	IORE2100..-CC	IORE2500..-CC	IORE3200..-CC	IORE3800..-CC	IORE4500..-CC	IORE5100..-CC
Ue max.										
750 V DC	800 A	1000 A	1250 A	1600 A	2000 A	2300 A	3200 A	3800 A	4500 A	5000 A
600 V DC	720 A	1000 A	1250 A	1600 A	2000 A	On request	On request	On request	On request	On request
1500 V DC	800 A	1000 A	1250 A	1600 A	2000 A	2300 A	3200 A	3800 A	4500 A	5000 A
1000 V DC	720 A	1000 A	1250 A	1600 A	2000 A	On request	On request	On request	On request	On request
1500 V DC	800 A	1000 A	1250 A	1600 A	2000 A	2300 A	3200 A	3800 A	4500 A	5000 A
1500 V DC	720 A	1000 A	1250 A	1600 A	2000 A	On request	On request	On request	On request	On request

Product overview

1SBC104001S0201

Questionnaire
Specification for R contactors

Customer .....
Contact person ..... Date .....
Tel. ..... e-mail .....

ABB .....
Contact person .....
Tel. .....

Quantity ..... Requested delivery date .....
Project / Application .....

Power circuit

AC switching

Application type
☐ AC-1 (resistive load)
☐ AC-3 (direct starting, switching off running motors)
☐ No load breaking
☐ Other .....
Number of poles: N.O. ..... N.C. .....
Rated operational current Ie ..... A
Max. making current ..... A
Max. breaking current ..... A
Rated operational voltage Ue ..... V ..... Hz

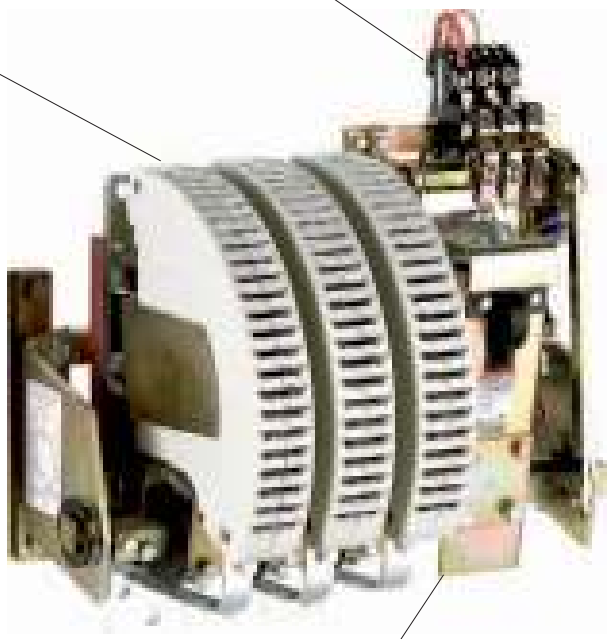
or

DC switching

Application type
☐ DC-1 (resistive load)
☐ DC-3 (shunt motors)
☐ DC-5 (series motors)
☐ No load breaking
☐ Other ..... L/R ..... ms
Number of poles: N.O. ..... N.C. .....
Rated operational current Ie ..... A
Making current ..... A
Breaking current min. ..... A max. ..... A
Rated operational voltage Ue ..... V DC

Auxiliary contacts

Number of N.O. auxiliary contacts .....
Number of N.C. auxiliary contacts .....



Control circuit (coil)

AC ☐ Voltage ..... V ..... Hz
DC ☐ Voltage ..... V DC

Options
☐ Magnetical latching
☐ Mechanical latching

Operating conditions

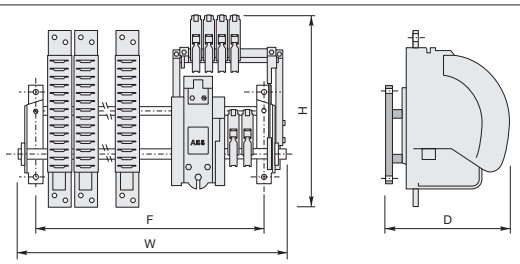
Switching frequency ..... cycles/h
Mech. durability required (millions of operating cycles) .....
Remarks .....

Accessories .....

Please add any other useful documents for further information e.g. technical specification, drawing, wiring diagram, etc.

Replacement of an existing contactor

Brand .....
Type .....
Fixing dimension F = ... mm
Overall dimensions W = ... mm
H = ... mm
D = ... mm



Please photocopy and forward. Questionnaire also available on the ABB Website:
www.abb.com/lowvoltage Section: Our offering Select: Control Products > Contactors > Bar mounted contactors

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Questionnaire
Specification for R contactors

Other information / Application type

This document is used to define the contactor specification according to the complete information on the application

Please photocopy and forward. Questionnaire also available on the ABB Website:
www.abb.com/lowvoltage Section: Our offering Select: Control Products > Contactors > Bar mounted contactors

1SBC104004S0201

Motor control and protection

Motor control and protection

Benefits and advantages **8**/2

Technical data **8**/3

2CDC135025C0201

Motor control and protection
Benefits and advantages

UMC100-FBP is a flexible, modular and expandable motor management system for constant-speed low-voltage range motors.
It's most important tasks include motor protection, prevention of plant standstills and the reduction of down time. This is made possible by early information relating to possible motor problems which avoids unplanned plant standstills. Even if a motor trips, quick diagnosis of the cause of the fault serves to reduce downtime.

UMC100-FBP combines in a very compact unit:

Motor protection
- Overload, underload
- Overvoltage, undervoltage
- Blocked rotor, low / high current
- Phase failure, imbalance, phase sequence
- Earth leakage
- Thermistor protection
- Limitation of starts per time
- One single version with integrated measuring system covers the rated
- motor current from 0,24 to 63 A

Motor control
- Integrated and easy to parametrize motor starter functions like direct, reverse, star-delta,...
- Additionally free programmable logic for application specific control functions
- Expansion modules DX111, DX122 for more I/Os
- Expansion modules VI150, VI155 for 3-phase voltage measuring

Motor diagnostics
- Quick and comprehensive access to all relevant data via fieldbus and/or operator panel
- Current, thermal load
- Phase voltages
- Power factor
- Energy

Communication
- Communication-independent basic device
- Freely selectable fieldbus protocol with FieldBusPlug
- Profibus DP
- DeviceNet
- Modbus
- CANopen

Typical application segments
- Oil & gas
- Cement
- Paper
- Mining
- Steel
- Chemical industry

Further information

UMC & FBP Catalogue	2CDC 190 022 D0204
UMC & FBP Brochure	2CDC 135 011 B0202

2CDC135025C0201

Basic device UMC100-FBP

UMC100-FBP allows the connection of one I/O-expansion module DX111 or DX122, and one voltage module VI150 or VI155. Expansion modules are connected via 2-wire bus, the max. distance to UMC100-FBP is 3 m.

Main power	
Voltage	max 1000 V AC
Frequency	45 to 65 Hz
Rated motor current	0.24 to 63 A, without accessories
	Greater currents with transformer
Transformer diameter	11 mm (max 25 mm²)
Tripping classes	5, 10, 20, 30, 40 in accordance with EN/IEC 60947-4-1
Short-circuit protection	Separate fuse on network side

Control unit	
Supply voltage	24 V DC
Reverse polarity protection	yes
Inputs	6 digital inputs 24 V DC
	1 PTC input
Outputs	3 relay outputs relay
	1 digital output transistor
Interfaces	1 for ABB FieldBusPlug
	1 for UMC100-PAN control station
	1 for expansion module
Parametric assignment	via fieldbus, control station and / or software
Addressing	Control station or addressing set
LEDs	3 LEDs: green, yellow, red

Environment and mechanical data	
Fastening	on DIN busbar (EN50022-35) or with 4 screws x M4
Dimensions (W x H x D)	70 x 105 x 110 mm (incl. FieldBusPlug and control panel)
Weight	0.39 kg
Terminal cross-section	max. 2.5 mm² or 2 x 1.5 mm²

I/O-expansion modules DX111 / DX122

Expansion modules to increase the number of I/Os of a UMC100-FBP. Easy use of inputs by parametrizing for fault or warning; individual message on operator panel configurable.

Supply voltage		24 V DC
Inputs	DX111	8 digital inputs 24 V DC
	DX122	8 digital inputs 110/230 V AC
Outputs		4 relay outputs relay
		1 analogue output, 0/4 to 20 mA / 0 to 10 V configurable
Fastening		on DIN busbar (EN50022-35)
Dimensions (W x H x D)		45 x 77 x 100 mm (without terminal block)

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Motor control and protection
Technical data

NEW

Voltage expansion modules

Measures the 3 phase voltages of a motor. Different versions for use in grounded and ungrounded networks.

Supply voltage		24 V DC
Inputs	VI150	3 analogue inputs 150 - 690 V AC
		For use in grounded networks
		Maximum operation altitude 2000 m
	VI155	3 analogue inputs 150 - 690 V AC
		For use in all networks
		Maximum operation altitude > 2000 m
Outputs		1 relay output
Fastening		on DIN busbar (EN50022-35)
Dimensions (W x H x D)		22.5 x 77 x 100 mm (without terminal block)

Control panel UMC100-PAN

Installation on the device or on the switching cabinet door

Graphics-enabled and backlit display, 3 LEDs for status indication

Freely configurable error messages

Multilingual: German, English, French, Italian, Portuguese, Spanish, Russian

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Notes

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Coordination with short-circuit protection devices

In compliance with standards IEC 60947-4-1 and EN 60947-4-1, we define for the contactors and starters the type, rating and characteristics of the short-circuit protection devices SCPD which allow selective protection against overloads and ensure protection against short circuits.

Basic functions

Any starter is designed to:
– start motors,
– ensure continuous functioning of motors,
– disconnect motors from the supply line,
– guarantee protection of motors against overloads.

The starter is typically made up of a switching device (contactor) and an overload protection device (thermal overload relay TOR or electronic overload relay EOR).

These two devices MUST be coordinated with equipment capable of providing protection against short circuit (SCPD: short circuit protective device): typically a circuit breaker with magnetic release only or a switch fuse. These are not necessarily part of the starter.

Applicable standards

IEC 60947-4-1 (EN 60947-4-1) precisely defines the different points to be considered in order to carry out correct coordination.

Complete coordination for a combination includes the following points:
– Selectivity test between the overload relay and the short-circuit protection device SCPD.
– Short-circuit condition tests:
  - at prospective "r" currents - These currents depend on the rated operational current of the starter (**Ie** AC-3) and are given by the standard (Table 11). For example:
    r = 1kA for **Ie** AC-3 < 16 A
    r = 3 kA for 16 A < **Ie** AC-3 < 63 A
    r = 5 kA for 63 A < **Ie** AC-3 < 125 A etc.
  - at the rated prospective short-circuit current "**Iq**" - This is the maximum current that the combination can withstand, for example 50 kA.

Types of coordination

IEC 60947-4-1 (EN 60947-4-1) defines two types of coordination according to the expected level of service continuity. Acceptable extreme damage for the switchgear is divided into two types.

Type 1: In short-circuit conditions, the contactor or starter does not endanger persons or installations and will not be able to then operate without being repaired or having parts replaced.

Type 2: In short-circuit conditions, the contactor or starter does not endanger persons or installations and will be able to operate afterwards. The risk of contacts light welding is acceptable.

The complete ABB offer

ABB has acquired years of experience with respect to problems of coordination and is able to make a complete offer based on tests performed in its qualified laboratories. This offer includes 400 V, 500 V, 690 V networks.

A complete data base of coordination tables, according to IEC 60947-4-1 (EN 60947-4-1), is available on the ABB Website.

In the coordination tables the following short-circuit protection devices are recommended:
– Moulded case circuit-breakers (MCCBs)
– Miniature circuit-breakers (MCBs)
– Switch-disconnector-fuses (aM, gG and BS)
– Manual Motor Starters (M.M.S.).

General remarks applicable to all tables

– Each table is defined for a maximum ambient temperature of 40 °C. For higher temperatures, apply a derating factor according to the following rules:
  - Fuses: factor of 0.8 applied to **In** for an ambient temperature of 70 °C
  - MCCBs and MCBs: factor of 0.8 applied to **In** for an ambient temperature of 60 °C
  - The starter derating factor depends on the operating conditions of thermal overload relays:
    Factor of 0.9 applied to **In** for an ambient temperature of 70 °C.
– Each table is defined for motor currents: 3-phase motors, 4-pole
– **Normal starting** means a starting time < 2 s. - **Difficult starting** means an accelerating time 10 s < **ts** < 30 s
  Tripping classes of thermal overload relays according to IEC 60947-4-1 (EN 60947-4-1): 10A and 10, and 30 for SU types
– In the tables with MCCBs, these are fitted with the magnetic relay alone. Setting is always carried out at > 12.3 **Ie** AC-3 so that the transient current peak occurring during starting does not lead to tripping.

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Coordination with short-circuit protection devices

A motor starter is typically made up of a switching device (contactor) and an overload protection device (see opposite page "Basic functions").

These two devices **must** be coordinated with an equipment capable of providing protection against short circuit (SCPD: Short-Circuit Protection Device).

A complete data base of coordination tables, according to **IEC 60947-4-1** (EN 60947-4-1) **or UL 508 / UL 60947-4-1**, is available on the ABB Website: see below.

Selection

Simple or multiple selections all from the same screen.

Short-circuit protection devices
- Air circuit breakers
- Fuses "gG" or "aM"
- Miniature circuit breaker
- Moulded case circuit breaker
- Manual motor starter

Starter type
- Direct-on-line normal start
- Direct-on-line heavy duty
- Star-delta normal start
- Soft starter normal start

Coordination
- IEC type 1 or type 2
- UL type A to Type F

Results

- Search results displayed at the bottom of the selection page.
- Only the most appropriate solutions to your application, will be displayed at the bottom of the page.
  "Enable Smart Current Search" function featured for the short-circuit current where "near to" selected values also are included in the result.
- Possible to print the page to a pdf file or from your printer.
- "Clear selection" function to deselect all selected.

Access

To find the coordination tables for motor protection, please see:

www.abb.com/lowvoltage then go to the right menu: "Support", select: "**Online Product Selection Tools**" then select "**Coordination Tables for motor protection**"

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